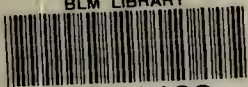


BLM LIBRARY



88071432

Department of  
Agriculture

Natural  
Resources  
Conservation  
Service

In cooperation with  
United States  
Department of the  
Interior, Bureau of Land  
Management, and  
University of Nevada  
Agricultural  
Experiment Station

# **Soil Survey of Northwest Elko County Area, Nevada, Parts of Elko and Eureka Counties**

## **Part I**



# How To Use This Soil Survey

---

This survey is divided into three parts. Part I includes general information about the survey area; descriptions of the detailed soil map units and soil series in the area; and a description of how the soils formed. Part II describes the use and management of the soils and the major soil properties. Part III includes the maps.

The **detailed soil map units** follow the general information about the survey area. These map units can be useful in planning the use and management of small areas.

To find information about your area of interest, locate that area on the **Index to Map Sheets**, note the number of the map sheet, and turn to that sheet.

Locate your area of interest on the map sheet. Note the map unit symbols that are in that area. Turn to the **Index to Map Units** in Part I of this survey, which lists the map units by symbol and name and shows the page where each map unit is described.

The **Summary of Tables** shows which table has data on a specific land use for each detailed soil map unit. See **Contents** for sections of this publication that may address your specific needs.

A **State Soil Geographic Database (STATSGO)** is available for this survey area. This database consists of a soils map at a scale of 1 to 250,000 and descriptions of groups of associated soils. It replaces the general soil map published in older soil surveys. The map and the database can be used for multicounty planning, and map output can be tailored for a specific use. More information about the State Soil Geographic Database for this survey area, or any portion of Nevada, is available at the local office of the Natural Resources Conservation Service.

Some standards or values may change as more information is collected and analyzed. Thus, as older published interpretive information becomes outdated, new interpretive data must be generated and tailored to local conditions. This information is added to the State Subset of the **Map Unit Interpretation Record (MUIR)** database as needed. Map Unit Interpretation Records are the soil survey specific data and interpretations in the state soil survey database.

BLM Library  
Denver Federal Center  
Bldg. 50, OC-521  
P.O. Box 25047  
Denver, CO 80225

---

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service has leadership for the Federal part of the National Cooperative Soil Survey.

Major fieldwork for this soil survey was completed in 1985. Soil names and descriptions were approved in 1986. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1985. This survey was made cooperatively by the Natural Resources Conservation Service, the United States Department of Interior, Bureau of Land Management, and the University of Nevada Agricultural Experiment Station. It is part of the technical assistance furnished to the Owyhee Conservation District.

Soil maps in this survey may be copied without permission. Enlargement of these maps, however, could cause misunderstanding of the detail of mapping. If enlarged, maps do not show the small areas of contrasting soils that could have been shown at a larger scale.

The United States Department of Agriculture (USDA) prohibits discrimination in its programs on the basis of race, color, national origin, sex, religion, age, disability, political beliefs and marital or familial status. (Not all prohibited bases apply to all programs.) Person with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact the USDA Office of Communications at (202) 720-2791.

To file a complaint, write the Secretary of Agriculture, U.S. Department of Agriculture, Washington, D.C., 20250, or call (202) 720-7327 (voice) or (202) 720-1127 (TDD). USDA is an equal opportunity employer.



# Contents

---

## Part I

<b>Index to map units</b> .....v	Erakatak series ..... 204
<b>Summary of tables</b> .....ix	Fulstone series ..... 205
<b>Foreword</b> .....xi	Gando series ..... 206
How this survey was made ..... 1	Gochea series..... 206
General nature of the survey area ..... 2	Graley series ..... 208
History..... 2	Gumble series..... 208
Industry, transportation, and recreation ..... 2	Hackwood series ..... 209
Physiography, drainage, and geology..... 3	Handy series ..... 210
Climate ..... 3	Hapgood series ..... 211
<b>Detailed Soil Map Units</b> ..... 5	Hatpeak series..... 212
Map Unit Descriptions ..... 6	Heechee series ..... 213
<b>Prime farmland</b> ..... 171	Humboldt series..... 213
<b>Classification of the soils</b> ..... 173	Hunnton series ..... 214
<b>Taxonomic units and their morphology</b> ..... 173	Kelk series ..... 215
Akler series ..... 173	Kleckner series ..... 217
Alley series..... 174	Kortty series ..... 218
Alyan series..... 175	Lerrow series ..... 219
Arcia series ..... 176	Linkup series ..... 220
Bartome series ..... 177	Loncan series ..... 220
Bilbo series ..... 178	Lynnbow series ..... 221
Bioya series ..... 179	Mahala series ..... 222
Blitzen series..... 180	McCleary series ..... 223
Booford series..... 181	McIvey series ..... 224
Bregar series..... 182	Midraw series..... 225
Buffaran series ..... 182	Ninemile series ..... 226
Bulake series..... 183	Olac series ..... 227
Bullump series..... 184	Old Camp series ..... 228
Carstump series ..... 185	Orovada series ..... 228
Cavanaugh series ..... 186	Pattani series..... 230
Chen series..... 186	Pequop series ..... 230
Cherry Spring series..... 187	Pernty series ..... 231
Chiara series..... 188	Petan series ..... 232
Chime series ..... 189	Pie Creek series ..... 233
Cleavage series ..... 190	Piline series..... 234
Clementine series ..... 191	Placeritos series..... 234
Clurde series..... 192	Puett series..... 236
Clurde Variant..... 193	Puett Variant..... 236
Coltroop series..... 193	Quarz series ..... 237
Cotant series ..... 194	Ramires series ..... 238
Creemon series ..... 195	Ratsow series..... 239
Crooked Creek series ..... 196	Relley series..... 240
Dacker series ..... 197	Reluctan series ..... 241
Deepeek series ..... 198	Rugar series ..... 241
Deseed series..... 199	Shabliss series..... 242
Deunah series ..... 200	Shalake series ..... 243
Dewar series..... 201	Shalper series..... 244
Donna series..... 202	Shively series ..... 245
Enko series ..... 203	Short Creek series..... 246

Skull Creek series .....	247
Snowmore series.....	247
Sodhouse series .....	249
Sonoma series .....	249
Soonaker series.....	250
Soughe series .....	251
Stampede series .....	252
Sumine series .....	253
Susie Creek series .....	253
Thwoop series .....	254
Troughs series .....	255
Trunk series.....	256
Tuffo series .....	257
Tusel series .....	257
Tusk series .....	258
Tweba series .....	259
Tweener series.....	260
Uprville series .....	261
Vanwyper series.....	261
Welch series .....	262
Weso series .....	263
Wickahoney series.....	264
Wieland series.....	265
Willhill series.....	266
Wilsor series .....	267
Xeric Torriorthents.....	268
Yuko series.....	268
Zevadez series .....	269
<b>Formation of the soils.....</b>	<b>271</b>
Factors of soil formation.....	271
Climate .....	271
Living organisms .....	272
Topography .....	272
Parent material.....	273
Time.....	274
<b>References.....</b>	<b>277</b>
<b>Glossary.....</b>	<b>279</b>

## Part II

<b>Summary of tables .....</b>	<b>iii</b>
<b>Crops and pasture .....</b>	<b>3</b>
Cropland limitations and hazards .....	3
Crop yield estimates .....	4
Land capability classification.....	4
Erosion factors .....	5
<b>Rangeland and grazeable woodland</b>	
<b>resource management.....</b>	<b>7</b>
Range condition.....	7
Rangeland management .....	7
Wildlife considerations .....	8
Plant Communities of	
Northwest Elko County Area .....	9
<b>Forest land .....</b>	<b>15</b>
Woodland ordination system.....	15
Forest land management and productivity.....	16
<b>Wildlife habitat.....</b>	<b>17</b>
Elements of wildlife habitat.....	17
Kinds of wildlife habitat .....	17
<b>Recreation.....</b>	<b>19</b>
<b>Engineering .....</b>	<b>21</b>
Building site development.....	21
Sanitary facilities .....	22
Waste management.....	23
Construction materials .....	23
Water management .....	24
<b>Soil properties .....</b>	<b>27</b>
Engineering index properties .....	27
Physical and chemical properties .....	28
Water features.....	29
Soil features.....	30
<b>References .....</b>	<b>33</b>
<b>Glossary .....</b>	<b>35</b>
<b>Tables .....</b>	<b>49</b>
<b>Rangeland plants and woodland</b>	
understory .....	1015

Issued November 1997

# Index to Map Units

001--Rubble land .....	6	576--Sumine-Hapgood-Cleavage association, very gravelly .....	28
120--Cotant, moderately steep-Lerrow-Cotant association .....	6	577--Sumine-Hapgood-Chen association .....	29
126--Cotant-Lerrow-Akler association .....	7	578--Sumine-Tusel-Hapgood association, very steep .....	29
127--Cotant-Ninemile-Lerrow association .....	8	579--Sumine-Pernty-Tusel association .....	30
128--Cotant-Graley association .....	8	580--Sumine-Pie Creek-Reluctan association .....	31
129--Cotant-Chen-Crooked Creek association .....	9	581--Sumine-Hapgood-Cleavage association .....	31
130--Cotant-Booford association .....	10	582--Sumine-Tusel-Cleavage association .....	32
140--Upville, frequently flooded-Upville association .....	10	583--Sumine-Hapgood-Pernty association .....	33
141--Upville-Kleckner association .....	11	584--Sumine-Tusel-Hapgood association, steep .....	34
150--Gochea gravelly loam, 2 to 4 percent slopes .....	11	585--Sumine-Rock outcrop-Rubble land association .....	35
161--Sonoma silt loam, drained, 0 to 2 percent slopes .....	11	586--Sumine-Loncan-Cleavage association .....	35
162--Sonoma silt loam, drained, occasionally flooded .....	12	600--Hapgood-Bullump-Gando association .....	36
184--Crooked Creek silty clay loam, frequently flooded, 0 to 2 percent slopes .....	12	601--Hapgood-Blitzen-Tusel association .....	37
185--Crooked Creek, moderately wet- Crooked Creek association .....	13	602--Hapgood-Hackwood-Tusel association .....	38
186--Crooked Creek-Crooked Creek, occasionally flooded-Crooked Creek, drained association .....	13	623--Soughe-Rock outcrop association .....	38
188--Crooked Creek-Welch-Crooked Creek, drained association .....	14	624--Soughe-Soughe, very steep-Rock outcrop association .....	39
190--Heechee-Heechee, cobbly association .....	14	625--Soughe-Alyan-Shalper association .....	39
200--Lynnbow-Rugar association .....	15	626--Soughe, cobbly-Vanwyper- Soughe association .....	40
201--Lynnbow-Lerrow-Crooked Creek association .....	15	690--Welch, drained-Welch association .....	41
210--Soonaker-Bulake association .....	16	920--Bullump-Gando-Tusel association .....	41
220--Cavanaugh-Rugar-Mclvey association .....	17	921--Bullump-Hackwood-Cleavage association .....	42
221--Cavanaugh-Quarz-Alyan association .....	17	922--Bullump-Cleavage-Hapgood association .....	43
233--Bioya-Bilbo-Chiara association .....	18	1130--Clementine silt loam, drained, 0 to 2 percent slopes .....	44
234--Bioya-Shabliss-Puett association .....	19	1131--Clementine, drained-Clementine, gently sloping-Clementine association .....	44
235--Bioya-Trunk-Alley association .....	19	1135--Clementine-Clurde association .....	45
236--Bioya-Wieland-Kleckner association .....	20	1150--Clurde-Wieland association .....	45
241--Wickahoney-Deunah-Petan association .....	21	1155--Clurde very fine sandy loam, 0 to 2 percent slopes .....	46
270--Pernty, steep-Loncan-Pernty association .....	21	1156--Clurde-Kortty association .....	46
280--Humboldt silty clay loam, occasionally flooded .....	22	1157--Clurde-Zevadez-Chiara association .....	47
308--Akler-Pattani-Cotant association .....	22	1190--Cherry Spring-Enko association .....	48
309--Akler-Susie Creek association .....	23	1191--Cherry Spring-Wieland association .....	48
457--Donna-Stampede-Short Creek association .....	24	1193--Cherry Spring-Hunnton-Chiara association .....	49
458--Donna-Stampede association .....	24	1210--Skull Creek-Shabliss-Puett association .....	49
464--Stampede silt loam, 2 to 8 percent slopes .....	25	1220--Hunnton, strongly sloping-Hunnton- Fulstone association .....	50
570--Sumine-Cleavage-Hapgood association .....	25	1221--Hunnton, moderately steep-Hunnton- Fulstone association .....	51
571--Sumine-Tusel-Gando association .....	26	1223--Hunnton-Shabliss-Puett association .....	51
572--Sumine-Reluctan-Cleavage association .....	27	1224--Hunnton-Trunk-Shabliss association .....	52
		1226--Hunnton-Wieland-Clementine association .....	53



1227--Hunnton-Chiara-Bilbo association.....	54
1228--Hunnton-Hunnton, moderately sloping association.....	54
1229--Hunnton-Chiara-Wieland association.....	55
1230--Fulstone-Hunnton association.....	56
1231--Fulstone-Fulstone, moderately steep- Hunnton association.....	56
1232--Fulstone-Fulstone, cobbly loam-Wieland association.....	57
1241--Enko-Shabliss-Orovada association.....	58
1242--Enko-Enko, strongly sloping association.....	58
1260--Kleckner-Upville-Fulstone association.....	59
1261--Kleckner-Heechee association.....	60
1290--Tweba very fine sandy loam, drained, 0 to 2 percent slopes.....	60
1350--Shabliss-Hunnton-Bioya association.....	60
1351--Shabliss-Bartome association.....	61
1352--Shabliss-Skull Creek-Puett association.....	62
1360--Orovada very fine sandy loam, 0 to 2 percent slopes.....	62
1362--Orovada-Clurde-Wieland association.....	63
1363--Orovada-Tweba-Weso association.....	64
1530--Creemon-Placeritos association.....	64
1572--Weso-Orovada-Shabliss association.....	65
1573--Weso-Orovada-Tweba association.....	65
1617--Cleavage-Hapgood-Tweener association.....	66
1618--Cleavage-Sumine-Pequop association.....	67
1619--Cleavage-Tusk-Sumine association.....	68
1621--Cleavage-Graley-Cleavage, moderately steep association.....	68
1622--Cleavage-Sumine-Hapgood association.....	69
1623--Cleavage-Hapgood-Sumine association.....	70
1625--Cleavage-Ninemile-Sumine association.....	71
1626--Cleavage-Carstump-Chen association.....	71
1628--Cleavage-Chen-Reluctan association.....	72
1640--Tusk-Cleavage-Hackwood association.....	73
1650--Ninemile-Tusk-Ninemile, steep association.....	73
1651--Ninemile-Reluctan-Ninemile, moderately steep association.....	74
1652--Ninemile, steep-Graley-Ninemile association.....	75
1653--Ninemile-Reluctan-Graley association.....	76

1655--Ninemile-Thwoop-Pequop association.....	76
1656--Ninemile-Pequop-Gumble association.....	77
1657--Ninemile-Alyan association.....	78
1658--Ninemile-Vanwyper-Ninemile, moderately steep association.....	79
1659--Ninemile-Carstump association.....	79
1660--Susie Creek-Pie Creek-Pattani association.....	80
1671--Linkup-Carstump-Linkup, very cobbly loam association.....	80
1672--Linkup, steep-Carstump-Linkup association.....	81
1673--Linkup-Quarz-Alyan association.....	82
1675--Linkup-Snowmore-Ratsow association.....	83
1676--Linkup-Quarz association.....	83
1680--Carstump-Reluctan-Ninemile association, hilly.....	84
1685--Carstump-Ninemile-Graley association.....	85
1686--Carstump-Reluctan-Ninemile association, steep.....	85
1687--Carstump, cobbly loam-Linkup-Carstump association.....	86
1691--Pequop-Rock outcrop-Rubble land association.....	87
1700--Cotant-Quarz-Ninemile association.....	87
1702--Cotant-Mclvey-Blitzen association.....	88
1703--Cotant-Lerrow-Bullump association.....	89
1711--Reluctan-Ninemile-Cleavage association.....	89
1712--Reluctan-Sumine-Cleavage association.....	90
1713--Reluctan-Erakatak-Rugar association.....	91
1720--Quarz-Alyan-Ninemile association.....	91
1725--Quarz-Cleavage-Loncan association.....	92
1726--Quarz-Ninemile-Pequop association.....	93
1730--Graley-Erakatak-Chen association.....	93
1732--Graley-Quarz-Ninemile association.....	94
1733--Graley-Loncan association.....	95
1740--Erakatak-Cleavage-Hackwood association.....	95
1741--Erakatak-Chen-Tusk association.....	96
1742--Erakatak-Rugar-Tusel association.....	97
1744--Erakatak-Graley-Tusel association.....	98
1746--Booford-Cotant-Blitzen association.....	98
1800--Bregar, moderately steep-Bregar- Carstump association.....	99
1802--Bregar-Ninemile-Pequop association.....	100
1803--Bregar-Sumine-Rock outcrop association.....	100

1805--Bregar-Deseed-Linkup association .....	101	2005--Alyan-Graley-Rock outcrop	
1810--Shively-Ninemile-Hackwood		association .....	125
association.....	102	2171--Deseed-Reluctan-Cleavage	
1830--Vanwyper, steep-Alyan-Vanwyper		association .....	126
association.....	103	2173--Deseed-Quarz association .....	126
1831--Vanwyper, moderately steep-Trunk-		2205--Coltroop-Snowmore association.....	127
Vanwyper association.....	103	2206--Coltroop-Vanwyper association.....	127
1832--Vanwyper-Trunk-Trunk, steep		2310--Bulake-Deunah-Bulake, very	
association.....	104	cobbly association .....	128
1833--Vanwyper-Rock outcrop-Trunk		2311--Bulake-Hatpeak-Petan association.....	129
association.....	105	2505--Buffaran-Zevadez association.....	129
1852--Gumble-Tuffo-Hunnton association .....	105	2511--Bilbo-Alley-Deepeek association .....	130
1853--Gumble-Tuffo-Rock outcrop		2514--Bilbo-Susie Creek-Buffaran	
association.....	106	association .....	131
1854--Gumble-Chen association .....	107	2521--Dewar-Chiara-Chiara, very	
1855--Gumble-Puett Variant-Xeric		cobbly association .....	132
Torriorthents association.....	107	2522--Dewar-Sodhouse association.....	132
1870--Chen-Graley-Quarz association .....	108	2531--Clurde Variant-Clurde-Rock outcrop	
1871--Chen-Cotant-Graley association .....	109	association .....	133
1872--Chen-Sumine-Tusel association .....	109	2541--Kelk very fine sandy loam, occasionally	
1874--Chen-Quarz-Arcia association.....	110	flooded, 0 to 2 percent slopes.....	134
1875--Chen-Bregar-Ramires association .....	111	2545--Kelk-Clurde association.....	134
1876--Chen-Chen, steep-Arcia association .....	112	2555--Piline silty clay loam .....	134
1877--Chen-Bregar-Loncan association .....	112	2560--McCleary silt loam, occasionally	
1880--Chen-Blitzen-Pequop association.....	113	flooded .....	135
1881--Chen-Blitzen-Loncan association .....	114	2561--McCleary cobbly silt loam, drained,	
1888--Chen-Pie Creek-Alyan association .....	114	rarely flooded.....	135
1889--Chen-Sumine association.....	115	2571--Chiara-Chiara, cobbly-Chiara, very	
1910--Mahala-Ramires association .....	116	cobbly association .....	136
1920--Lerrow-Chen-Cotant association .....	116	2572--Chiara-Chiara, moderately eroded	
1921--Lerrow-Quarz-Rugar association .....	117	association .....	136
1931--Tweener-Cleavage-Reluctan		2573--Chiara, very cobbly-Chiara	
association.....	118	association .....	137
1932--Tweener-Sumine-Cleavage		2575--Chiara-Dacker-Shalake	
association.....	118	association .....	138
1933--Tweener-Pequop-Cleavage		2577--Chiara-Orovada association .....	138
association.....	119	2600--Shalake-Chiara-Shalake, gently	
1950--McIvey-McIvey, very cobbly-		sloping association .....	139
Tusel association .....	120	2611--Dacker-Hunnton association .....	140
1980--Thwoop-Trunk-Pequop association.....	121	2612--Dacker-Zevadez association.....	140
2000--Alyan-Cotant-Akler association.....	121	2615--Dacker-Chiara association .....	141
2001--Alyan, steep-Bregar-Alyan		2621--Gochea-Susie Creek-Carstump	
association.....	122	association .....	141
2002--Alyan, moderately steep-Alyan-Quarz		2641--Olac-Snowmore association .....	142
association.....	123	2650--Wieland-Bartome-Zevadez association.....	143
2003--Alyan-Deepeek-Susie Creek		2651--Wieland-Buffaran association .....	143
association.....	123	2652--Wieland-Dacker-Zevadez association.....	144
2004--Alyan, cobbly loam-Ninemile-		2655--Wieland-Gumble-Bilbo association .....	145
Alyan association.....	124	2656--Wieland-Hunnton-Thwoop association .....	145



---

2658--Wieland very gravelly loam, 15 to 30 percent slopes.....	146	2804--Bartome-Chiara association .....	159
2666--Puett-Orovada association .....	147	2805--Bartome very fine sandy loam, 0 to 2 percent slopes .....	160
2667--Puett-Rock outcrop-Clurde association.....	147	2807--Bartome-Coltroop-Zevadez association .....	160
2668--Puett-Yuko-Zevadez association.....	148	2808--Bartome-Susie Creek-Wieland association .....	161
2710--Ramires-Bartome-Bilbo association .....	148	2809--Bartome-Dacker association.....	162
2711--Ramires-Bilbo-Bufferan association.....	149	2820--Alley-Vanwyper-Rock outcrop association .....	162
2741--Wilsor-Wilsor, moderately steep association.....	150	2822--Alley-Rock outcrop-Rubble land association .....	163
2751--Yuko-Chime-Clurde association.....	150	3000--Handy-Wilsor-Deseed association .....	163
2775--Zevadez-Bartome-Wieland association .....	151	3010--Relley-Kelk association .....	164
2776--Zevadez-Chiara association .....	152	3020--Sodhouse-Chiara association .....	165
2777--Zevadez-Wieland-Clurde association .....	152	3030--Deepeek-Alley association.....	165
2778--Zevadez-Yuko-Kelk association .....	153	3100--Ratsow-Quarz-Susie Creek association .....	166
2780--Snowmore, cobbly-Snowmore association.....	154	3510--Midraw-Troughs-Midraw, strongly sloping association .....	166
2781--Snowmore, cobbly-Snowmore, very cobbly-Snowmore association.....	155	3710--Petan-Bulake-Rock outcrop association .....	167
2782--Snowmore-Zevadez-Snowmore, cobbly association.....	155	3715--Petan-Deunah-Hatpeak association .....	168
2783--Snowmore-Willhill association .....	156	3721--Hatpeak-Deunah association.....	168
2790--Old Camp-Troughs-Olac association .....	157	3722--Hatpeak-Hatpeak, moderately steep association .....	169
2801--Bartome-Alley-Clurde association .....	157	W--Water .....	170
2802--Bartome-Bufferan association .....	158		
2803--Bartome-Bufferan-Ramires association.....	158		

# Summary of Tables

---

## Part II

Temperature and precipitation (table 1) .....	47
Freeze dates in spring and fall (table 2) .....	49
Growing season (table 3) .....	50
Acreage and proportionate extent of the soils (table 4) .....	53
Cropland limitations and hazards (table 5) .....	59
Land capability and yields per acre of crops (table 6) .....	85
Suitability for rangeland seeding (table 7) .....	89
Woodland management and productivity (table 8) .....	123
Wildlife habitat (table 9) .....	125
Recreational development (table 10) .....	165
Building site development (table 11) .....	251
Sanitary facilities (table 12) .....	337
Construction materials (table 13) .....	425
Water management (table 14) .....	509
Engineering index properties (table 15) .....	589
Physical properites of the soils (table 16) .....	765
Chemical properties of the soils (table 17) .....	853
Water features (table 18) .....	931
Soil features (table 19) .....	971
Classification of the soils (table 20) .....	1011



# Foreword

---

This soil survey contains information that can be used in land-planning programs in Northwest Elko County Area, Nevada, Parts of Elko and Eureka Counties. It contains predictions of soil behavior for selected land uses. The survey also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

This soil survey is designed for many different users. Farmers, ranchers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the survey to plan land use, select sites for construction, and identify special practices needed to ensure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are shallow to bedrock. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described. Information on specific uses is given for each soil. Help in using this publication and additional information are available at the local office of the Natural Resources Conservation Service or Nevada Cooperative Extension.



William D. Goddard  
State Conservationist  
Natural Resources Conservation Service





# Soil Survey of Northwest Elko County Area, Nevada, Parts of Elko and Eureka Counties

---

By Terry S. Bowerman, Natural Resources Conservation Service

Fieldwork by Terry S. Bowerman, Paul W. Blackburn, Alan R. Wasner, Roderick W. Douglass, Jr., and H. David Pickel, Natural Resources Conservation Service; Mike Jackson, Steve Mellington and Mike Zielinski, Bureau of Land Management; Goodson and Associates, Inc. under Bureau of Land Management contract in the Owyhee Desert

United States Department of Agriculture, Natural Resources Conservation Service,  
in cooperation with  
United States Department of the Interior, Bureau of Land Management, and the  
University of Nevada Agricultural Experiment Station

## How This Survey Was Made

This survey was made to provide information about the soils and miscellaneous areas in the survey area. The information includes a description of the soils and miscellaneous areas and their location and a discussion of their suitability, limitations, and management for specified uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They dug many holes to study the soil profile, which is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

The soils and miscellaneous areas in the survey area are in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind or segment of the landscape. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landscape, soil scientists develop a concept, or model, of how the soils were formed. Thus, during mapping, this model enables the soil scientists to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Individual soils on the landscape commonly merge into one another as their characteristics gradually change. To construct an accurate map, however, soil

scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted color, texture, size, and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and

tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

## General Nature of the Survey Area

This section gives general information about the survey area. It briefly discusses history; industries, transportation, and recreation; physiography, drainage, and geology; and climate.

### History

The survey area was long inhabited by the tribes of the Shoshone Indians. Fur trappers first entered the area in 1826 via the South Fork of the Owyhee River. For the next twenty years, the area saw little intrusion by others. However, in the 1850's the Overland Trail, which follows the Humboldt River, became the major route to California. Emigrants and gold seekers began filtering into the area, settling in the valleys and searching for gold in the mountains.

Sheep ranching was the first livestock industry to get its start when the first flocks were herded to California. The Owyhee Desert became a popular winter range, and, by 1860, permanent flocks were a common sight in the area.

The cattle industry was of major importance by the 1880's. Herds were being driven north from Texas and Mexico. When it was discovered that these cattle could

survive the winters, stockmen began settling into the area. The Owyhee Desert served as a favorite winter range for the cattle.

In 1867, gold was discovered in the Tuscarora Mountains and the mining camp of Tuscarora was established. Tuscarora became the biggest producing mine in northeast Nevada, and by 1884, it outnumbered Elko in population, importance and influence. The community flourished through the turn of the century until the mines began to close, and by the 1930's, Tuscarora had dwindled to a mere handful of people.

In 1907, gold was discovered in the mountains near Rock Creek and the mining camp of Midas was established. Although this community did not grow as large as Tuscarora, it was a thriving little boomtown during its peak from 1916 through 1921. The mine was eventually closed in 1942, and today, few people remain in Midas.

## Industry, Transportation, and Recreation

The main industries in the survey area are ranching and mining.

The ranches are dominantly cow-calf operations, usually weaning and selling the calves in the fall of the year. A few operations carry over yearling steers to be sold at a later date. There are a limited number of ranches that are cow-calf-sheep operations.

The crops grown are dominantly meadow hay with some areas of alfalfa. The major sources of irrigation water in the survey area are the South Fork of the Owyhee River and its tributaries, Willow Creek, Rock Creek and Evans Creek. Irrigation water is stored in Desert Ranch Reservoir, Wilson Reservoir, Bull Run Reservoir, and Willow Creek Reservoir. At the higher elevations, numerous small springs and seeps and several small perennial streams provide adequate watering facilities for livestock and wildlife. In the valleys, most of the streams are intermittent. The ground water supply in the valleys is quite variable in quality. The amount that is available for irrigation in each valley has not been determined.

There has been mining of gold, silver, and barite in the past, but, at present, there is little mining activity in the survey area.

The area is so sparsely settled that there is little need for improved roads. In the summer and fall, most of the survey area is accessible by dirt roads or jeep trails.

There is one main highway in the survey area. This is State Route 226 which runs from Taylor Canyon north through Independence Valley.

The survey area provides recreational opportunities for hunting, fishing, backpacking, and other back country activities. Wilson Reservoir, Willow Reservoir, and Bull Run Reservoir are noted fisheries. Perennial streams also provide opportunities for fishing. Game birds, deer, and pronghorn antelope are common in the area. The remoteness and rugged terrain typical of the



area are desired by many backpacking enthusiasts and campers.

## Physiography, Drainage, and Geology

The Northwest Elko County Area, Nevada, Parts of Elko and Eureka Counties, is in the north-central part of Nevada. It has a total area of 1,899,379 acres or 2,968 square miles. The small unincorporated town of Tuscarora is located in the southeastern part of the survey area, and the town of Midas is located in the southwestern part of the survey area.

Important physiographic features in the survey area include the Tuscarora, Bull Run, and Independence Mountains; Squaw and Independence Valleys; and the Owyhee Desert. Elevation ranges from about 4,600 feet in the Evans Creek drainage to about 8,500 feet in the Bull Run mountains.

The northern two-thirds of the survey area, including Independence Valley, is drained by the South Fork of the Owyhee River and its tributaries. The South Fork of the Owyhee River joins the main fork in the north, outside the survey area.

The south part of the survey area is drained by Rock Creek, Maggie Creek, and their tributaries. These two creeks join the Humboldt River south of the survey area.

The southwestern corner of the survey area is drained by intermittent Evans Creek, its tributaries, and by many intermittent creeks which end in valleys to the southwest.

The valleys in the survey area consist of Quaternary alluvial deposits (4). These deposits makeup the floodplains and the fan piedmonts. Typical soils formed in these deposits include Donna, Fulstone, Hunnton, Orovada, Shabliss, and Stampede.

The fan piedmonts of the Owyhee Desert and the fan piedmonts around Willow Creek Reservoir and north of Squaw Valley consist of Tertiary basalt, gravel and tuffaceous sediments, ash-flow tuffs, and tuffaceous sedimentary rocks all overlain by a thin mantle of Quaternary alluvial deposits. Typical soils derived from this material include Bartome, Chiara, Donna, Fulstone, Hunnton, Orovada, Shabliss, and Stampede.

The hills and plateaus in the survey area consist of Tertiary ash-flow tuffs, tuffaceous sedimentary rocks, welded and non-welded silicic ash-flow tuffs, and rhyolitic flows (4). Typical soils derived from these rocks include Chen, Coltroop, Cotant, Lerrow, Linkup, Ninemile, Petan, Sumine, and Vanwyper.

The mountains in the survey area consist mainly of

Tertiary welded and non-welded silicic ash-flow tuffs, andesite, rhyolitic flows with minor amounts of shale, chert, quartzite, and limestone (4). Typical soils derived from these rocks include Bregar, Carstump, Cleavage, Graley, Hapgood, Linkup, Ninemile, and Sumine.

## Climate

Prepared by the National Climatic Center, Asheville, North Carolina.

Table 1 gives data on temperature and precipitation for the survey area as recorded at Owyhee and Tuscarora in the period 1951 to 1978. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on length of the growing season.

In winter, the average temperature is 29 degrees F and the average daily minimum temperature is 19 degrees F. The lowest temperature on record, which occurred at Owyhee on January 19, 1922, is -35 degrees. In summer, the average temperature is 64 degrees and the average daily maximum temperature is 82 degrees. The highest recorded temperature, which occurred at Owyhee on August 13, 1933, is 108 degrees.

Growing degree days are shown in table 1. They are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (40 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The total annual precipitation is 14 inches at Owyhee and 12 inches at Tuscarora. Forty to fifty percent of the precipitation usually falls in April through September. The growing season for most crops is within this period. Thunderstorms occur on about 20 days each year, mainly in the summer.

The average seasonal snowfall is 40 to 80 inches. The greatest snow depth at any one time during the period of record was 42 inches. On an average of 20 to 30 days, at least 1 inch of snow is on the ground. The number of such days varies greatly from year to year.

The average relative humidity in mid-afternoon is about 40 percent. Humidity is higher at night, and the average at dawn is about 70 percent. The sun shines 80 percent of the time in summer and 70 percent in winter. The prevailing wind is from the southwest. Average windspeed (7 miles per hour) is highest in spring.



# Detailed Soil Map Units

---

The map units on the detailed maps in Part III of this publication represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this section, along with the maps, can be used to determine the suitability and potential of a unit for specific uses. They also can be used to plan the management needed for those uses. More information about each map unit is given under the headings "Use and Management of the Soils" and "Soil Properties."

A map unit delineation on the detailed soil maps represents an area dominated by one or more soils or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils or miscellaneous areas. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils and miscellaneous areas are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, are mapped without including areas of other taxonomic classes. Consequently, map units are made up of the soils or miscellaneous areas for which they are named and some "included" areas that belong to other taxonomic classes.

Most included soils have properties and behavioral characteristics similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, inclusions. They may or may not be mentioned in the map unit description. Other included soils and miscellaneous areas, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, inclusions. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. The included areas of contrasting soils or miscellaneous areas are mentioned in the map unit descriptions. A few included areas may not have been observed, and, consequently, they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of included areas in a map unit in no way diminishes the usefulness or accuracy of the data.

The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into segments that have similar use and management requirements. The delineation of such landscape segments on the map provides sufficient information for the development of resource plans, but, if intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit. The principal hazards and limitations to be considered in planning for specific uses are identified in the tables and narrative in Part II.

## Kinds of Map Units

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, wetness, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Some of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, gravelly loam is a phase of the Gochea series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes or associations.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Cotant-Lerrow-Akler association is an example.

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rubble land is an example.

## Acreage and Extent

Table 4 gives the acreage and proportionate extent of each map unit. Other tables (see "Summary of Tables")



give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing the soils or miscellaneous areas.

## Headings and Introductory Phases

In the map unit descriptions that follow, a semitabular format is used. In this format, the major headings are centered in the column (for example, *Composition*). They identify the information grouped directly below them. Introducing each item of information under the centered heading is a term or phrase (for example, *Major Components*) that identifies or describes the information. Many of the centered headings and introductory terms are self-explanatory, however, some of them need further explanation and are defined in the Glossary. Explanations of the headings and introductory phrases are provided in the following paragraphs, generally in the order in which they are used in the map unit descriptions.

*Composition* is given for the components (soils or miscellaneous areas) identified in the name of the map unit as well as for the contrasting inclusions.

*Contrasting Inclusions* are areas of components that differ sufficiently in use and management from the soils or miscellaneous areas for which the map unit is named. As was explained earlier, inclusions can either be *similar* or *contrasting*. Note that in the *Composition* section a single percentage is provided for a named soil and its similar inclusions because their use and management are similar.

*Map Unit Setting* is given for the entire map unit. This section gives the position on the landscape. The landscape positions given for the entire map unit generally are broader than those given for each component. Below the map unit setting, the position of each component and inclusion is listed, and the physiographic location of each is identified.

*Major Component Description* lists the characteristics of the major components. These include elevation, texture of the surface layer, drainage class, parent material, and climatic data.

*Dominant Present Vegetation* lists the common plants growing on each soil at the present time. The present vegetation may be similar to the potential native plant community, but, in some areas it consists of other plants, either cultivated or wild, that dominate the soils in the map unit.

*Ecological Site* is the assigned rangeland or grazed forest land ecological site that identifies a unique potential native plant community. The plant species and production typical of each ecological site are listed by map unit in the section "Rangeland Plants and Woodland Understory." Additional information about these sites is provided under the heading "Rangeland and Grazeable Woodland Resource Management" in Part II of this publication. Further information also can be obtained from the local office of the Natural Resources Conservation Service.

## Map Unit Descriptions

### 001--Rubble land

#### *Composition*

##### *Major Components*

Rubble land fragmental material, 50 to 75 percent slopes--100 percent

#### *Map Unit Setting*

*Landscape position:* Mountains

Rubble land--Landform: Mountains; geomorphic position: backslope

#### *Major Component Description*

##### **Rubble land Miscellaneous Area**

*Elevation:* 5,200 to 8,000 feet

*Surface layer texture:* Fragmental material

*Drainage class:* Excessively drained

#### *Dominant Present Vegetation*

Rubble land: None

#### *Ecological Site*

Rubble land: None

### 120--Cotant, moderately steep-Lerrow-Cotant association

#### *Composition*

##### *Major Components*

Cotant gravelly clay loam, 15 to 30 percent slopes--40 percent

Lerrow gravelly loam, 4 to 15 percent slopes--30 percent

Cotant gravelly clay loam, 2 to 8 percent slopes--20 percent

##### *Contrasting Inclusions*

Inclusion 1: Bregar very gravelly sandy loam, 15 to 30 percent slopes--5 percent

Inclusion 2: Welch silt loam, drained, 0 to 2 percent slopes, rarely flooded--5 percent

#### *Map Unit Setting*

*Landscape position:* Hills

Cotant--Landform: Hills; geomorphic position: backslope

Lerrow--Landform: Hills; geomorphic position: backslope; aspect: north

Cotant--Landform: Hills; geomorphic position: summit

Inclusion 1--Landform: Hills; geomorphic position: backslope; aspect: south

Inclusion 2--Landform: Drainageways

#### *Major Component Description*

##### **Cotant Series**

*Elevation:* 5,000 to 6,500 feet

*Precipitation:* About 14 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Gravelly clay loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from tuffaceous rocks

#### **Lerrow Series**

*Elevation:* 5,000 to 6,500 feet  
*Precipitation:* About 14 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum derived from tuffaceous rocks

#### **Cotant Series**

*Elevation:* 5,000 to 6,500 feet  
*Precipitation:* About 14 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Gravelly clay loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum derived from tuffaceous rocks

#### ***Dominant Present Vegetation***

Cotant: Bluegrass, bottlebrush squirreltail, low sagebrush  
 Lerrow: Idaho fescue, basin big sagebrush, bluebunch wheatgrass  
 Cotant: Idaho fescue, bluebunch wheatgrass, low sagebrush  
 Inclusion 1: Low sagebrush  
 Inclusion 2: Basin big sagebrush, basin wildrye

#### ***Ecological Site***

Cotant: 025XY017NV  
 Lerrow: 025XY027NV  
 Cotant: 025XY017NV  
 Inclusion 1: 025XY051NV  
 Inclusion 2: 025XY003NV

### **126--Cotant-Lerrow-Akler association**

#### ***Composition***

##### ***Major Components***

Cotant very gravelly loam, 15 to 30 percent slopes--40 percent  
 Lerrow cobbly loam, 15 to 50 percent slopes--25 percent  
 Akler loam, 4 to 15 percent slopes--20 percent

##### ***Contrasting Inclusions***

Inclusion 1: Crooked Creek silty clay loam, 0 to 2 percent slopes, occasionally flooded--5 percent  
 Inclusion 2: Cleavage extremely gravelly loam, 15 to 30 percent slopes--4 percent  
 Inclusion 3: Rock outcrop--3 percent  
 Inclusion 4: Lerrow gravelly loam, 4 to 15 percent slopes--3 percent

#### ***Map Unit Setting***

*Landscape position:* Hills  
 Cotant--Landform: Hills; geomorphic position: backslope  
 Lerrow--Landform: Hills; geomorphic position: backslope; aspect: south  
 Akler--Landform: Hills; geomorphic position: toeslope  
 Inclusion 1--Landform: Drainageways  
 Inclusion 2--Landform: Hills; geomorphic position: summit  
 Inclusion 3--Landform: Hills; geomorphic position: summit  
 Inclusion 4--Landform: Hills; geomorphic position: backslope; aspect: north

#### ***Major Component Description***

##### ***Cotant Series***

*Elevation:* 6,200 to 6,700 feet  
*Precipitation:* About 14 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Very gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum derived from tuffaceous rocks

##### ***Lerrow Series***

*Elevation:* 6,200 to 6,700 feet  
*Precipitation:* About 14 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Cobbly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from tuffaceous rocks

##### ***Akler Series***

*Elevation:* 6,200 to 6,700 feet  
*Precipitation:* About 12 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum derived from tuffaceous rocks

#### ***Dominant Present Vegetation***

Cotant: Bluegrass, bottlebrush squirreltail, low sagebrush  
 Lerrow: Antelope bitterbrush, bluebunch wheatgrass, mountain big sagebrush  
 Akler: Bluegrass, bottlebrush squirreltail, low sagebrush  
 Inclusion 1: Nevada bluegrass  
 Inclusion 2: Idaho fescue, low sagebrush  
 Inclusion 3: None  
 Inclusion 4: Idaho fescue, big sagebrush

#### ***Ecological Site***

Cotant: 025XY017NV  
 Lerrow: 025XY009NV  
 Akler: 025XY018NV



Inclusion 1: 025XY006NV  
 Inclusion 2: 025XY024NV  
 Inclusion 3: None  
 Inclusion 4: 025XY027NV

## 127--Cotant-Ninemile-Lerrow association

### *Composition*

#### **Major Components**

Cotant very gravelly silty clay loam, 4 to 15 percent slopes--35 percent  
 Ninemile very cobbly loam, 15 to 30 percent slopes--35 percent  
 Lerrow gravelly loam, 15 to 30 percent slopes--15 percent

#### **Contrasting Inclusions**

Inclusion 1: Loncan very gravelly loam, 15 to 30 percent slopes--7 percent  
 Inclusion 2: Rugar loam, 8 to 15 percent slopes--6 percent  
 Inclusion 3: Crooked Creek gravelly silty clay loam, 2 to 4 percent slopes--1 percent  
 Inclusion 4: Quarz very gravelly loam, 15 to 30 percent slopes--1 percent

### *Map Unit Setting*

*Landscape position:* Hills

Cotant--Landform: Hills; geomorphic position: toeslope

Ninemile--Landform: Hills; geomorphic position: summit

Lerrow--Landform: Hills; geomorphic position: backslope; aspect: north

Inclusion 1--Landform: Hills; geomorphic position: toeslope; shape of slope: concave; aspect: north

Inclusion 2--Landform: Hills; geomorphic position: toeslope; shape of slope: concave

Inclusion 3--Landform: Drainageways

Inclusion 4--Landform: Hills; geomorphic position: backslope; aspect: south

### *Major Component Description*

#### **Cotant Series**

*Elevation:* 5,200 to 6,400 feet

*Precipitation:* About 14 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Very gravelly silty clay loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from sedimentary rocks

#### **Ninemile Series**

*Elevation:* 5,200 to 6,400 feet

*Precipitation:* About 14 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Very cobbly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from tuffaceous rocks

#### **Lerrow Series**

*Elevation:* 5,200 to 6,400 feet

*Precipitation:* About 14 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from sedimentary rocks

### *Dominant Present Vegetation*

Cotant: Bluegrass, bottlebrush squirreltail, low sagebrush

Ninemile: Bluegrass, bottlebrush squirreltail, low sagebrush

Lerrow: Idaho fescue, basin big sagebrush, bluebunch wheatgrass

Inclusion 1: Antelope bitterbrush, big sagebrush, bluebunch wheatgrass

Inclusion 2: Idaho fescue, bulbous oniongrass, wyethia

Inclusion 3: Nevada bluegrass

Inclusion 4: Big sagebrush, bluebunch wheatgrass

### *Ecological Site*

Cotant: 025XY017NV

Ninemile: 025XY017NV

Lerrow: 025XY027NV

Inclusion 1: 025XY012NV

Inclusion 2: 025XY047NV

Inclusion 3: 025XY006NV

Inclusion 4: 025XY009NV

## 128--Cotant-Graley association

### *Composition*

#### **Major Components**

Cotant very gravelly loam, 8 to 15 percent slopes--45 percent

Graley very gravelly loam, 8 to 15 percent slopes--40 percent

#### **Contrasting Inclusions**

Inclusion 1: Typic Argixerolls, fine-loamy, mixed, frigid very gravelly loam--10 percent

Inclusion 2: Lerrow cobbly loam, 30 to 50 percent slopes--3 percent

Inclusion 3: Crooked Creek silty clay loam, 2 to 4 percent slopes, frequently flooded--2 percent

### *Map Unit Setting*

*Landscape position:* Hills

Cotant--Landform: Hills; geomorphic position: summit

Graley--Landform: Hills; geomorphic position: backslope; aspect: north

Inclusion 1--Landform: Hills; geomorphic position: backslope; shape of slope: concave; aspect: north

Inclusion 2--Landform: Hills; geomorphic position: backslope; aspect: south

Inclusion 3--Landform: Drainageways



**Major Component Description****Cotant Series***Elevation:* 6,200 to 6,600 feet*Precipitation:* About 14 inches*Air temperature:* About 44 degrees*Frost-free season:* About 85 days*Surface layer texture:* Very gravelly loam*Drainage class:* Well drained*Dominant parent material:* Residuum derived from tuffaceous rocks**Graley Series***Elevation:* 6,200 to 6,600 feet*Precipitation:* About 14 inches*Air temperature:* About 44 degrees*Frost-free season:* About 85 days*Surface layer texture:* Very gravelly loam*Drainage class:* Well drained*Dominant parent material:* Residuum derived from tuffaceous rocks**Dominant Present Vegetation**

Cotant: Bluegrass, bottlebrush squirreltail, low sagebrush

Graley: Bluegrass, bottlebrush squirreltail, low sagebrush

Inclusion 1: Big sagebrush, bluebunch wheatgrass

Inclusion 2: Antelope bitterbrush, big sagebrush, bluebunch wheatgrass

Inclusion 3: Sedge, tufted hairgrass

**Ecological Site**

Cotant: 025XY017NV

Graley: 025XY012NV

Inclusion 1: 025XY027NV

Inclusion 2: 025XY009NV

Inclusion 3: 025XY005NV

**129--Cotant-Chen-Crooked Creek association****Composition****Major Components**

Cotant very gravelly clay loam, 4 to 15 percent slopes--35 percent

Chen very gravelly loam, 4 to 15 percent slopes--30 percent

Crooked Creek silty clay loam, 0 to 4 percent slopes, occasionally flooded--20 percent

**Contrasting Inclusions**

Inclusion 1: Aridic Palexerolls, very fine, montmorillonitic, frigid silty clay loam, 4 to 15 percent slopes--5 percent

Inclusion 2: Quarz very gravelly loam, 15 to 50 percent slopes--5 percent

Inclusion 3: Loncan very gravelly loam, 30 to 50 percent slopes--3 percent

Inclusion 4: Crooked Creek silty clay loam, 0 to 2 percent slopes, frequently flooded--2 percent

**Map Unit Setting***Landscape position:* Hills

Cotant--Landform: Hills; geomorphic position: toeslope

Chen--Landform: Hills; geomorphic position: summit

Crooked Creek--Landform: Stream terraces

Inclusion 1--Landform: Hills; geomorphic position: toeslope

Inclusion 2--Landform: Hills; geomorphic position: backslope; aspect: south

Inclusion 3--Landform: Hills; geomorphic position: backslope; aspect: north

Inclusion 4--Landform: Flood plains

**Major Component Description****Cotant Series***Elevation:* 5,600 to 6,400 feet*Precipitation:* About 14 inches*Air temperature:* About 44 degrees*Frost-free season:* About 85 days*Surface layer texture:* Very gravelly clay loam*Drainage class:* Well drained*Dominant parent material:* Residuum derived from sedimentary rocks**Chen Series***Elevation:* 5,600 to 6,400 feet*Precipitation:* About 14 inches*Air temperature:* About 44 degrees*Frost-free season:* About 85 days*Surface layer texture:* Very gravelly loam*Drainage class:* Well drained*Dominant parent material:* Residuum and colluvium derived from sedimentary rocks**Crooked Creek Series***Elevation:* 5,600 to 6,400 feet*Precipitation:* About 14 inches*Air temperature:* About 44 degrees*Frost-free season:* About 85 days*Surface layer texture:* Silty clay loam*Drainage class:* Poorly drained*Dominant parent material:* Alluvium derived from mixed rocks**Dominant Present Vegetation**

Cotant: Bluegrass, bottlebrush squirreltail, low sagebrush

Chen: Bluegrass, bottlebrush squirreltail, low sagebrush

Crooked Creek: Nevada bluegrass, alpine timothy

Inclusion 1: Low sagebrush

Inclusion 2: Bluebunch wheatgrass, mountain big sagebrush

Inclusion 3: Idaho fescue, antelope bitterbrush, bluebunch wheatgrass, mountain big sagebrush

Inclusion 4: Sedge, tufted hairgrass

**Ecological Site**

Cotant: 025XY017NV

Chen: 025XY017NV

Crooked Creek: 025XY006NV

Inclusion 1: 025XY017NV

Inclusion 2: 025XY009NV  
 Inclusion 3: 025XY012NV  
 Inclusion 4: 025XY005NV

### 130--Cotant-Booford association

#### *Composition*

##### **Major Components**

Cotant gravelly clay loam, 2 to 8 percent slopes--65 percent

Booford silt loam, 2 to 8 percent slopes--30 percent

##### **Contrasting Inclusions**

Inclusion 1: Puett sandy loam, 8 to 15 percent slopes--3 percent

Inclusion 2: Welch loam, drained, 2 to 4 percent slopes, rarely flooded--2 percent

#### *Map Unit Setting*

*Landscape position:* Hills

Cotant--Landform: Hills; geomorphic position: backslope; shape of slope: plane

Booford--Landform: Hills; geomorphic position: backslope; shape of slope: convex

Inclusion 1--Landform: Hills; geomorphic position: backslope; shape of slope: convex; aspect: south

Inclusion 2--Landform: Drainageways

#### *Major Component Description*

##### **Cotant Series**

*Elevation:* 5,700 to 6,000 feet

*Precipitation:* About 14 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Gravelly clay loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from tuffaceous rocks

##### **Booford Series**

*Elevation:* 5,700 to 6,000 feet

*Precipitation:* About 16 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Silt loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from tuffaceous rocks

#### *Dominant Present Vegetation*

Cotant: Bluegrass, bottlebrush squirreltail, low sagebrush

Booford: Idaho fescue, bluebunch wheatgrass, mountain big sagebrush

Inclusion 1: Wyoming big sagebrush, rabbitbrush

Inclusion 2: Basin big sagebrush, basin wildrye, rabbitbrush

#### *Ecological Site*

Cotant: 025XY017NV

Booford: 025XY012NV

Inclusion 1: 025XY025NV  
 Inclusion 2: 025XY003NV

### 140--Upville, frequently flooded-Upville association

#### *Composition*

##### **Major Components**

Upville gravelly loam, 0 to 2 percent slopes, frequently flooded--55 percent

Upville gravelly loam, 0 to 2 percent slopes--35 percent

##### **Contrasting Inclusions**

Inclusion 1: Aridic Haploxerolls, sandy-skeletal, mixed, frigid gravelly sandy loam--5 percent

Inclusion 2: Cumulic Haplaquolls, sandy-skeletal, mixed, frigid sandy loam--5 percent

#### *Map Unit Setting*

*Landscape position:* Intermontane basins

Upville--Landform: Alluvial fans; geomorphic position: summit; shape of slope: concave

Upville--Landform: Alluvial fans; geomorphic position: summit; shape of slope: convex

Inclusion 1--Landform: Drainageways

Inclusion 2--Landform: Drainageways

#### *Major Component Description*

##### **Upville Series**

*Elevation:* 5,700 to 6,000 feet

*Precipitation:* About 12 inches

*Air temperature:* About 43 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

##### **Upville Series**

*Elevation:* 5,700 to 6,000 feet

*Precipitation:* About 12 inches

*Air temperature:* About 43 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

#### *Dominant Present Vegetation*

Upville: Nevada bluegrass, cheatgrass

Upville: Big sagebrush, bluebunch wheatgrass, bluegrass, cheatgrass

Inclusion 1: Basin big sagebrush, cheatgrass

Inclusion 2: Nevada bluegrass, sedge, tufted hairgrass, willow

#### *Ecological Site*

Upville: 025XY006NV

Upville: 025XY014NV

Inclusion 1: 025XY003NV

Inclusion 2: 025XY005NV



**141--Upville-Kleckner association****Composition****Major Components**

Upville gravelly loam, 2 to 4 percent slopes--45 percent  
 Kleckner gravelly loam, 2 to 8 percent slopes--45 percent

**Contrasting Inclusions**

Inclusion 1: Clurde very fine sandy loam, 2 to 8 percent slopes--10 percent

**Map Unit Setting**

*Landscape position:* Intermontane basins

Upville--Landform: Fan skirts; geomorphic position: footslope

Kleckner--Landform: Fan remnants; geomorphic position: summit; position on slope: upper; shape of slope: plane

Inclusion 1--Landform: Fan remnants; geomorphic position: summit; position on slope: upper; shape of slope: concave

**Major Component Description****Upville Series**

*Elevation:* 5,000 to 5,500 feet

*Precipitation:* About 11 inches

*Air temperature:* About 43 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

**Kleckner Series**

*Elevation:* 5,500 to 6,000 feet

*Precipitation:* About 11 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

**Dominant Present Vegetation**

Upville: Big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Kleckner: Big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Inclusion 1: Wyoming big sagebrush

**Ecological Site**

Upville: 025XY014NV

Kleckner: 025XY014NV

Inclusion 1: 025XY019NV

**150--Gochea gravelly loam, 2 to 4 percent slopes****Composition****Major Components**

Gochea gravelly loam, 2 to 4 percent slopes--85 percent

**Contrasting Inclusions**

Inclusion 1: Aridic Duric Haploxerolls, loamy-skeletal, mixed, frigid gravelly loam--10 percent

Inclusion 2: Upville gravelly loam, wet, 0 to 2 percent slopes--3 percent

Inclusion 3: Durargidic Argixerolls, fine, montmorillonitic, frigid gravelly loam--2 percent

**Map Unit Setting**

*Landscape position:* Intermontane basins

Gochea--Landform: Fan remnants; geomorphic position: summit

Inclusion 1--Landform: Fan remnants; geomorphic position: summit

Inclusion 2--Landform: Inset fans

Inclusion 3--Landform: Fan remnants; geomorphic position: footslope

**Major Component Description****Gochea Series**

*Elevation:* 5,600 to 6,200 feet

*Precipitation:* About 12 inches

*Air temperature:* About 45 degrees

*Frost-free season:* About 90 days

*Surface layer texture:* Gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

**Dominant Present Vegetation**

Gochea: Big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Inclusion 1: Big sagebrush

Inclusion 2: Nevada bluegrass

Inclusion 3: Bluegrass, bottlebrush squirreltail, low sagebrush

**Ecological Site**

Gochea: 025XY014NV

Inclusion 1: 025XY014NV

Inclusion 2: 025XY006NV

Inclusion 3: 025XY017NV

**161--Sonoma silt loam, drained, 0 to 2 percent slopes****Composition****Major Components**

Sonoma silt loam, drained, 0 to 2 percent slopes--85 percent

**Contrasting Inclusions**

Inclusion 1: Sonoma silt loam, slightly saline, 0 to 2 percent slopes, occasionally flooded--10 percent



Inclusion 2: Fluvaquentic Haplaquolls, fine-loamy, mixed (calcareous), frigid silt loam--5 percent

#### **Map Unit Setting**

*Landscape position:* Intermontane basins

Sonoma--Landform: Flood plains

Inclusion 1--Landform: Flood plains

Inclusion 2--Landform: Flood plains; position on slope: upper part

#### **Major Component Description**

**Sonoma Series**

*Elevation:* 4,900 to 5,200 feet

*Precipitation:* About 9 inches

*Air temperature:* About 48 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Silt loam

*Drainage class:* Poorly drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

#### **Dominant Present Vegetation**

Sonoma: Douglas rabbitbrush, basin big sagebrush

Inclusion 1: Basin big sagebrush, rubber rabbitbrush

Inclusion 2: Basin big sagebrush

#### **Ecological Site**

Sonoma: 025XY003NV

Inclusion 1: 024XY006NV

Inclusion 2: 025XY003NV

### **162--Sonoma silt loam, drained, occasionally flooded**

#### **Composition**

##### **Major Components**

Sonoma silt loam, 0 to 2 percent slopes, occasionally flooded--90 percent

##### **Contrasting Inclusions**

Inclusion 1: Aquic Torriorthents, fine-silty, mixed (calcareous), mesic silt loam--5 percent

Inclusion 2: Aquic Durorthidic Torriorthents, fine-silty, mixed (calcareous), mesic silt loam--5 percent

#### **Map Unit Setting**

*Landscape position:* Intermontane basins

Sonoma--Landform: Flood plains

Inclusion 1--Landform: Drainageways

Inclusion 2--Landform: Stream terraces

#### **Major Component Description**

**Sonoma Series**

*Elevation:* 4,500 to 4,600 feet

*Precipitation:* About 9 inches

*Air temperature:* About 48 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Silt loam

*Drainage class:* Poorly drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

#### **Dominant Present Vegetation**

Sonoma: Basin big sagebrush, basin wildrye, black greasewood

Inclusion 1: Basin big sagebrush, basin wildrye

Inclusion 2: Black greasewood

#### **Ecological Site**

Sonoma: 024XY006NV

Inclusion 1: 024XY006NV

Inclusion 2: 024XY011NV

### **184--Crooked Creek silty clay loam, frequently flooded, 0 to 2 percent slopes**

#### **Composition**

##### **Major Components**

Crooked Creek silty clay loam, 0 to 2 percent slopes, frequently flooded--95 percent

##### **Contrasting Inclusions**

Inclusion 1: Welch silt loam, 0 to 2 percent slopes, frequently flooded--2 percent

Inclusion 2: Welch silt loam, drained, 0 to 2 percent slopes, rarely flooded--3 percent

#### **Map Unit Setting**

*Landscape position:* Intermontane basins

Crooked Creek--Landform: Flood plains

Inclusion 1--Landform: Flood plains

Inclusion 2--Landform: Stream terraces; position on slope: upper part

#### **Major Component Description**

**Crooked Creek Series**

*Elevation:* 5,700 to 6,200 feet

*Precipitation:* About 14 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Silty clay loam

*Drainage class:* Poorly drained

*Dominant parent material:* Alluvium derived from mixed rocks

#### **Dominant Present Vegetation**

Crooked Creek: Cinquefoil, rush, sedge, tufted hairgrass

Inclusion 1: Rush, sedge

Inclusion 2: Basin big sagebrush, basin wildrye

#### **Ecological Site**

Crooked Creek: 025XY005NV

Inclusion 1: 025XY005NV

Inclusion 2: 025XY003NV

**185--Crooked Creek, moderately wet-Crooked Creek association****Composition****Major Components**

Crooked Creek silty clay loam, moderately wet, 0 to 2 percent slopes, frequently flooded--70 percent  
 Crooked Creek silty clay loam, 0 to 2 percent slopes--15 percent

**Contrasting Inclusions**

Inclusion 1: Welch silt loam, drained, 0 to 2 percent slopes, rarely flooded--10 percent  
 Inclusion 2: Crooked Creek silty clay loam, 0 to 2 percent slopes, occasionally flooded--4 percent  
 Inclusion 3: Sonoma silt loam, drained, slightly saline, 0 to 2 percent slopes--1 percent

**Map Unit Setting**

*Landscape position:* Intermontane basins  
 Crooked Creek--Landform: Stream terraces  
 Crooked Creek--Landform: Flood plains  
 Inclusion 1--Landform: Stream terraces  
 Inclusion 2--Landform: Stream terraces  
 Inclusion 3--Landform: Stream terraces; position on slope: lower part

**Major Component Description****Crooked Creek Series**

*Elevation:* 5,600 to 5,800 feet  
*Precipitation:* About 14 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Silty clay loam  
*Drainage class:* Poorly drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Crooked Creek Series**

*Elevation:* 5,600 to 5,800 feet  
*Precipitation:* About 14 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Silty clay loam  
*Drainage class:* Poorly drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Dominant Present Vegetation**

Crooked Creek: Nevada bluegrass, basin wildrye, mat muhly, willow  
 Crooked Creek: Bluegrass, rush, sedge, tufted hairgrass  
 Inclusion 1: Basin big sagebrush, basin wildrye, bluegrass  
 Inclusion 2: Nevada bluegrass, alpine timothy  
 Inclusion 3: Basin wildrye, black greasewood

**Ecological Site**

Crooked Creek: 025XY001NV  
 Crooked Creek: 025XY005NV  
 Inclusion 1: 025XY003NV

Inclusion 2: 025XY006NV  
 Inclusion 3: 024XY007NV

**186--Crooked Creek-Crooked Creek, occasionally flooded-Crooked Creek, drained association****Composition****Major Components**

Crooked Creek silty clay loam, 0 to 2 percent slopes, frequently flooded--60 percent  
 Crooked Creek silty clay loam, 0 to 2 percent slopes, occasional flooded--15 percent  
 Crooked Creek silty clay loam, drained, 0 to 2 percent slopes--15 percent

**Contrasting Inclusions**

Inclusion 1: Cumulic Haplaquolls, loamy-skeletal, mixed, frigid silt loam--5 percent  
 Inclusion 2: Cumulic Haplaquolls, loamy-skeletal, mixed, frigid silt loam, drained--5 percent

**Map Unit Setting**

*Landscape position:* Intermontane basins  
 Crooked Creek--Landform: Stream terraces  
 Crooked Creek--Landform: Stream terraces  
 Crooked Creek--Landform: Stream terraces  
 Inclusion 1--Landform: Drainageways  
 Inclusion 2--Landform: Drainageways

**Major Component Description****Crooked Creek Series**

*Elevation:* 5,700 to 6,000 feet  
*Precipitation:* About 14 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Silty clay loam  
*Drainage class:* Poorly drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Crooked Creek Series**

*Elevation:* 5,700 to 6,000 feet  
*Precipitation:* About 14 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Silty clay loam  
*Drainage class:* Poorly drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Crooked Creek Series**

*Elevation:* 5,700 to 6,000 feet  
*Precipitation:* About 14 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Silty clay loam  
*Drainage class:* Poorly drained  
*Dominant parent material:* Alluvium derived from mixed rocks



***Dominant Present Vegetation***

Crooked Creek: Cinquefoil, rush, sedge, tufted hairgrass

Crooked Creek: Nevada bluegrass, alpine timothy, basin wildrye, sedge

Crooked Creek: Basin big sagebrush, basin wildrye, bluegrass

Inclusion 1: Rush, sedge, tufted hairgrass

Inclusion 2: Basin big sagebrush, basin wildrye

***Ecological Site***

Crooked Creek: 025XY005NV

Crooked Creek: 025XY006NV

Crooked Creek: 025XY003NV

Inclusion 1: 025XY005NV

Inclusion 2: 025XY003NV

**188--Crooked Creek-Welch-Crooked Creek, drained association*****Composition******Major Components***

Crooked Creek silty clay loam, 0 to 2 percent slopes, frequently flooded--45 percent

Welch silt loam, drained, 2 to 4 percent slopes, rarely flooded--25 percent

Crooked Creek silty clay loam, drained, 0 to 2 percent slopes--15 percent

***Contrasting Inclusions***

Inclusion 1: Welch silt loam, 0 to 2 percent slopes, frequently flooded--10 percent

Inclusion 2: Crooked Creek silty clay loam, gravelly substratum, 0 to 2 percent slopes, frequently flooded--5 percent

***Map Unit Setting***

*Landscape position:* Intermontane basins

Crooked Creek--Landform: Flood plains

Welch--Landform: Stream terraces

Crooked Creek--Landform: Stream terraces

Inclusion 1--Landform: Flood plains

Inclusion 2--Landform: Flood plains

***Major Component Description******Crooked Creek Series***

*Elevation:* 5,200 to 5,600 feet

*Precipitation:* About 14 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Silty clay loam

*Drainage class:* Poorly drained

*Dominant parent material:* Alluvium derived from mixed rocks

***Welch Series***

*Elevation:* 5,200 to 5,600 feet

*Precipitation:* About 14 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Silt loam

*Drainage class:* Very poorly drained

*Dominant parent material:* Alluvium derived from mixed rocks

***Crooked Creek Series***

*Elevation:* 5,200 to 5,600 feet

*Precipitation:* About 14 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Silty clay loam

*Drainage class:* Poorly drained

*Dominant parent material:* Alluvium derived from mixed rocks

***Dominant Present Vegetation***

Crooked Creek: Nevada bluegrass, rush, sedge, tufted hairgrass, willow

Welch: Basin big sagebrush, basin wildrye, bluegrass

Crooked Creek: Basin big sagebrush, basin wildrye, bluegrass

Inclusion 1: Rush, sedge, tufted hairgrass

Inclusion 2: Rush, sedge, tufted hairgrass

***Ecological Site***

Crooked Creek: 025XY005NV

Welch: 025XY003NV

Crooked Creek: 025XY003NV

Inclusion 1: 025XY005NV

Inclusion 2: 025XY005NV

**190--Heechee-Heechee, cobbly association*****Composition******Major Components***

Heechee gravelly loam, 4 to 15 percent slopes--60 percent

Heechee cobbly loam, 4 to 15 percent slopes--25 percent

***Contrasting Inclusions***

Inclusion 1: Typic Argixerolls, fine-loamy, mixed, frigid very gravelly loam, 2 to 8 percent slopes--5 percent

Inclusion 2: Durargidic Argixerolls, clayey-skeletal, montmorillonitic, frigid gravelly loam, 4 to 15 percent slopes--5 percent

Inclusion 3: Crooked Creek silty clay loam, 2 to 8 percent slopes, frequently flooded--5 percent

***Map Unit Setting***

*Landscape position:* Fan piedmonts

Heechee--Landform: Fan remnants; geomorphic position: summit; shape of slope: convex

Heechee--Landform: Fan remnants; geomorphic position: summit; shape of slope: convex

Inclusion 1--Landform: Fan remnants; geomorphic position: toeslope; position on slope: lower part

Inclusion 2--Landform: Fan remnants; geomorphic position: summit

Inclusion 3--Landform: Inset fans



**Major Component Description****Heechee Series***Elevation:* 5,600 to 6,400 feet*Precipitation:* About 14 inches*Air temperature:* About 43 degrees*Frost-free season:* About 85 days*Surface layer texture:* Gravelly loam*Drainage class:* Well drained*Dominant parent material:* Alluvium derived from mixed rocks**Heechee Series***Elevation:* 5,600 to 6,400 feet*Precipitation:* About 14 inches*Air temperature:* About 43 degrees*Frost-free season:* About 85 days*Surface layer texture:* Cobbly loam*Drainage class:* Well drained*Dominant parent material:* Alluvium derived from mixed rocks**Dominant Present Vegetation**

Heechee: Idaho fescue, antelope bitterbrush, bluebunch wheatgrass, mountain big sagebrush

Heechee: Idaho fescue, antelope bitterbrush, bluebunch wheatgrass, mountain big sagebrush

Inclusion 1: Idaho fescue, basin big sagebrush

Inclusion 2: Idaho fescue, bluegrass, low sagebrush

Inclusion 3: Rush, sedge, tufted hairgrass, willow

**Ecological Site**

Heechee: 025XY027NV

Heechee: 025XY007NV

Inclusion 1: 025XY027NV

Inclusion 2: 025XY017NV

Inclusion 3: 025XY005NV

**200--Lynnbow-Rugar association****Composition****Major Components**

Lynnbow silt loam, 2 to 8 percent slopes--55 percent

Rugar loam, 2 to 8 percent slopes--30 percent

**Contrasting Inclusions**

Inclusion 1: Bilbo very gravelly very fine sandy loam, 30 to 50 percent slopes--7 percent

Inclusion 2: Cotant gravelly clay loam, 15 to 50 percent slopes--4 percent

Inclusion 3: Crooked Creek silty clay loam, drained, 0 to 2 percent slopes--2 percent

Inclusion 4: Crooked Creek silty clay loam, 0 to 2 percent slopes, frequently flooded--2 percent

**Map Unit Setting***Landscape position:* Intermontane basins

Lynnbow--Landform: Pediments; geomorphic position: summit; shape of slope: plane

Rugar--Landform: Pediments; geomorphic position: summit; shape of slope: convex

Inclusion 1--Landform: Fan remnants; geomorphic position: backslope; aspect: south

Inclusion 2--Landform: Pediments; geomorphic position: backslope

Inclusion 3--Landform: Inset fans

Inclusion 4--Landform: Inset fans

**Major Component Description****Lynnbow Series***Elevation:* 5,500 to 6,200 feet*Precipitation:* About 14 inches*Air temperature:* About 43 degrees*Frost-free season:* About 85 days*Surface layer texture:* Silt loam*Drainage class:* Well drained*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash**Rugar Series***Elevation:* 5,500 to 6,200 feet*Precipitation:* About 16 inches*Air temperature:* About 43 degrees*Frost-free season:* About 85 days*Surface layer texture:* Loam*Drainage class:* Well drained*Dominant parent material:* Residuum derived from tuffaceous rocks**Dominant Present Vegetation**

Lynnbow: Idaho fescue, low sagebrush

Rugar: Idaho fescue, basin big sagebrush, bluegrass

Inclusion 1: Big sagebrush, bluebunch wheatgrass, cheatgrass

Inclusion 2: Idaho fescue, low sagebrush

Inclusion 3: Basin big sagebrush, basin wildrye, bluegrass

Inclusion 4: Rush, sedge, willow

**Ecological Site**

Lynnbow: 025XY017NV

Rugar: 025XY027NV

Inclusion 1: 025XY015NV

Inclusion 2: 025XY017NV

Inclusion 3: 025XY003NV

Inclusion 4: 025XY005NV

**201--Lynnbow-Lerrow-Crooked Creek association****Composition****Major Components**

Lynnbow silt loam, 4 to 15 percent slopes--40 percent

Lerrow gravelly loam, 4 to 15 percent slopes--30 percent

Crooked Creek silty clay loam, 2 to 4 percent slopes, occasionally flooded--15 percent

**Contrasting Inclusions**

Inclusion 1: Cotant gravelly clay loam, 2 to 8 percent slopes--7 percent

Inclusion 2: Chen very gravelly sandy clay loam, 4 to 15 percent slopes--3 percent  
 Inclusion 3: Ninemile very cobbly loam, 2 to 8 percent slopes--3 percent  
 Inclusion 4: Cotant cobbly loam, 8 to 15 percent slopes--2 percent

### ***Map Unit Setting***

*Landscape position:* Hills  
 Lynnbow--Landform: Hills; geomorphic position: summit; shape of slope: convex  
 Lerrow--Landform: Hills; geomorphic position: summit; shape of slope: plane  
 Crooked Creek--Landform: Stream terraces  
 Inclusion 1--Landform: Hills; geomorphic position: summit; shape of slope: plane  
 Inclusion 2--Landform: Hills; geomorphic position: summit; shape of slope: plane  
 Inclusion 3--Landform: Hills; geomorphic position: summit; shape of slope: plane  
 Inclusion 4--Landform: Hills; geomorphic position: backslope

### ***Major Component Description***

#### **Lynnbow Series**

*Elevation:* 5,800 to 6,300 feet  
*Precipitation:* About 14 inches  
*Air temperature:* About 43 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Silt loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

#### **Lerrow Series**

*Elevation:* 5,800 to 6,300 feet  
*Precipitation:* About 14 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from sedimentary rocks

#### **Crooked Creek Series**

*Elevation:* 5,800 to 6,300 feet  
*Precipitation:* About 14 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Silty clay loam  
*Drainage class:* Poorly drained  
*Dominant parent material:* Alluvium derived from mixed rocks

### ***Dominant Present Vegetation***

Lynnbow: Nevada bluegrass, alpine timothy, mat muhly, sedge  
 Lerrow: Antelope bitterbrush, big sagebrush, bluebunch wheatgrass, cheatgrass  
 Crooked Creek: Nevada bluegrass, cheatgrass, meadow barley, sedge, squirreltail

Inclusion 1: Low sagebrush  
 Inclusion 2: Bluegrass, low sagebrush  
 Inclusion 3: Bluegrass, low sagebrush  
 Inclusion 4: Bluegrass, low sagebrush

### ***Ecological Site***

Lynnbow: 025XY017NV  
 Lerrow: 025XY027NV  
 Crooked Creek: 025XY006NV  
 Inclusion 1: 025XY017NV  
 Inclusion 2: 025XY017NV  
 Inclusion 3: 025XY017NV  
 Inclusion 4: 025XY017NV

## **210--Soonaker-Bulake association**

### ***Composition***

#### ***Major Components***

Soonaker fine sandy loam, 2 to 8 percent slopes--50 percent  
 Bulake gravelly loam, 2 to 8 percent slopes--35 percent  
***Contrasting Inclusions***  
 Inclusion 1: Typic Argixerolls, fine-loamy, mixed, frigid very gravelly loam, 2 to 8 percent slopes--10 percent  
 Inclusion 2: Welch silt loam, drained, 0 to 2 percent slopes, rarely flooded--5 percent

### ***Map Unit Setting***

*Landscape position:* Hills  
 Soonaker--Landform: Hills; geomorphic position: summit  
 Bulake--Landform: Hills; geomorphic position: summit; shape of slope: convex  
 Inclusion 1--Landform: Hills; geomorphic position: toeslope  
 Inclusion 2--Landform: Drainageways

### ***Major Component Description***

#### **Soonaker Series**

*Elevation:* 5,200 to 5,400 feet  
*Precipitation:* About 14 inches  
*Air temperature:* About 43 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum derived from tuffaceous rocks

#### **Bulake Series**

*Elevation:* 5,200 to 5,400 feet  
*Precipitation:* About 14 inches  
*Air temperature:* About 43 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum derived from volcanic rocks



***Dominant Present Vegetation***

Soonaker: Idaho fescue, basin big sagebrush,  
bluegrass, cheatgrass, rabbitbrush

Bulake: Idaho fescue, bluegrass, bottlebrush  
squirreltail, low sagebrush

Inclusion 1: Basin big sagebrush

Inclusion 2: Basin big sagebrush, basin wildrye,  
bluegrass

***Ecological Site***

Soonaker: 025XY027NV

Bulake: 025XY017NV

Inclusion 1: 025XY027NV

Inclusion 2: 025XY003NV

**220--Cavanaugh-Rugar-Mclvey association*****Composition******Major Components***

Cavanaugh very stony loam, 15 to 50 percent slopes--  
50 percent

Rugar clay loam, 4 to 15 percent slopes--20 percent

Mclvey cobbly loam, 15 to 50 percent slopes--15  
percent

***Contrasting Inclusions***

Inclusion 1: Crooked Creek silty clay loam, 0 to 2  
percent slopes, occasionally flooded--10 percent

Inclusion 2: Lithic Argixerolls, clayey-skeletal,  
montmorillonitic, frigid very gravelly loam--3 percent

Inclusion 3: Rock outcrop--2 percent

***Map Unit Setting***

*Landscape position:* Hills

Cavanaugh--Landform: Hills; geomorphic position:  
backslope; shape of slope: convex

Rugar--Landform: Hills; geomorphic position: footslope;  
shape of slope: concave

Mclvey--Landform: Hills; geomorphic position:  
backslope; aspect: north

Inclusion 1--Landform: Drainageways

Inclusion 2--Landform: Hills

Inclusion 3--Landform: Hills

***Major Component Description******Cavanaugh Series***

*Elevation:* 5,600 to 6,700 feet

*Precipitation:* About 14 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Very stony loam

*Drainage class:* Well drained

*Dominant parent material:* Colluvium derived from  
volcanic rocks

***Rugar Series***

*Elevation:* 5,600 to 6,700 feet

*Precipitation:* About 16 inches

*Air temperature:* About 43 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Clay loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from  
sedimentary rocks

***Mclvey Series***

*Elevation:* 5,600 to 6,700 feet

*Precipitation:* About 15 inches

*Air temperature:* About 43 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Cobbly loam

*Drainage class:* Well drained

*Dominant parent material:* Colluvium derived from  
sedimentary rocks

***Dominant Present Vegetation***

Cavanaugh: Idaho fescue, bluebunch wheatgrass, low  
sagebrush

Rugar: Basin wildrye, bottlebrush squirreltail, mulesear  
wyethia, slender wheatgrass

Mclvey: Idaho fescue, antelope bitterbrush, mountain  
big sagebrush

Inclusion 1: Nevada bluegrass, alpine timothy

Inclusion 2: Idaho fescue, bottlebrush squirreltail,  
serviceberry

Inclusion 3: None

***Ecological Site***

Cavanaugh: 025XY017NV

Rugar: 025XY047NV

Mclvey: 025XY012NV

Inclusion 1: 025XY006NV

Inclusion 2: 025XY046NV

Inclusion 3: None

**221--Cavanaugh-Quarz-Alyan association*****Composition******Major Components***

Cavanaugh very stony loam, 15 to 50 percent slopes--  
35 percent

Quarz very gravelly loam, 30 to 50 percent slopes--25  
percent

Alyan gravelly clay loam, 15 to 30 percent slopes--25  
percent

***Contrasting Inclusions***

Inclusion 1: Pachic Argixerolls, fine-loamy, mixed, frigid  
very gravelly loam, 15 to 50 percent slopes--10  
percent

Inclusion 2: Tweener very cobbly sandy loam, 15 to 30  
percent slopes--5 percent

***Map Unit Setting***

*Landscape position:* Hills

Cavanaugh--Landform: Hills; geomorphic position:  
backslope; shape of slope: convex

Quarz--Landform: Hills; geomorphic position:  
backslope; aspect: south

Alyan--Landform: Hills; geomorphic position:  
backslope; aspect: north



Inclusion 1--Landform: Hills; geomorphic position: backslope; position on slope: lower; shape of slope: concave; aspect: north  
 Inclusion 2--Landform: Hills; geomorphic position: summit

### ***Major Component Description***

#### **Cavanaugh Series**

*Elevation:* 5,400 to 6,100 feet  
*Precipitation:* About 14 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Very stony loam  
*Drainage class:* Well drained  
*Dominant parent material:* Colluvium derived from volcanic rocks

#### **Quarz Series**

*Elevation:* 5,400 to 6,100 feet  
*Precipitation:* About 12 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Very gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

#### **Alyan Series**

*Elevation:* 5,400 to 6,100 feet  
*Precipitation:* About 12 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Gravelly clay loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from tuffaceous rocks

### ***Dominant Present Vegetation***

Cavanaugh: Idaho fescue, bluebunch wheatgrass, low sagebrush  
 Quarz: Basin wildrye, big sagebrush, bluebunch wheatgrass  
 Alyan: Idaho fescue, bluegrass, mountain big sagebrush  
 Inclusion 1: Idaho fescue, basin big sagebrush  
 Inclusion 2: Antelope bitterbrush, bluegrass, cheatgrass, mountain big sagebrush

### ***Ecological Site***

Cavanaugh: 025XY017NV  
 Quarz: 025XY009NV  
 Alyan: 025XY027NV  
 Inclusion 1: 0250X027NV  
 Inclusion 2: 025XY007NV

## **233--Bioya-Bilbo-Chiara association**

### ***Composition***

#### ***Major Components***

Bioya loam, 2 to 8 percent slopes--55 percent

Bilbo gravelly loam, 15 to 30 percent slopes--15 percent

Chiara silt loam, 2 to 8 percent slopes--15 percent

### **Contrasting Inclusions**

Inclusion 1: Puett fine sandy loam, 8 to 15 percent slopes--5 percent

Inclusion 2: Hunnton silt loam, 2 to 8 percent slopes--5 percent

Inclusion 3: Xerollic Durargids, loamy, mixed, mesic, shallow gravelly loam, 2 to 8 percent slopes--3 percent

Inclusion 4: Orovada loam, 0 to 2 percent slopes--2 percent

### ***Map Unit Setting***

*Landscape position:* Fan piedmonts

Bioya--Landform: Fan remnants; geomorphic position: summit

Bilbo--Landform: Fan remnants; geomorphic position: backslope; aspect: south

Chiara--Landform: Fan remnants; geomorphic position: summit; position on slope: upper part

Inclusion 1--Landform: Fan remnants; geomorphic position: shoulder; aspect: south

Inclusion 2--Landform: Fan remnants; geomorphic position: summit; aspect: north

Inclusion 3--Landform: Fan remnants; geomorphic position: summit; aspect: north

Inclusion 4--Landform: Inset fans

### ***Major Component Description***

#### **Bioya Series**

*Elevation:* 5,300 to 5,600 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from volcanic rocks, loess and volcanic ash

#### **Bilbo Series**

*Elevation:* 5,300 to 5,600 feet  
*Precipitation:* About 10 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

#### **Chiara Series**

*Elevation:* 5,300 to 5,600 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 105 days  
*Surface layer texture:* Silt loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

***Dominant Present Vegetation***

Bioya: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass  
 Bilbo: Big sagebrush, bluebunch wheatgrass, cheatgrass  
 Chiara: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass  
 Inclusion 1: Wyoming big sagebrush, bottlebrush squirreltail, cheatgrass, rabbitbrush  
 Inclusion 2: Wyoming big sagebrush, bottlebrush squirreltail  
 Inclusion 3: Wyoming big sagebrush, bottlebrush squirreltail  
 Inclusion 4: Wyoming big sagebrush, bottlebrush squirreltail

***Ecological Site***

Bioya: 025XY019NV  
 Bilbo: 025XY015NV  
 Chiara: 025XY019NV  
 Inclusion 1: 025XY025NV  
 Inclusion 2: 025XY019NV  
 Inclusion 3: 025XY019NV  
 Inclusion 4: 025XY019NV

**234--Bioya-Shabliss-Puett association*****Composition******Major Components***

Bioya very fine sandy loam, 2 to 8 percent slopes--55 percent  
 Shabliss very fine sandy loam, 2 to 8 percent slopes--15 percent  
 Puett stony sandy loam, 15 to 30 percent slopes--15 percent

***Contrasting Inclusions***

Inclusion 1: Rock outcrop--5 percent  
 Inclusion 2: Xeric Torriorthents, coarse-loamy, mixed, nonacid, mesic gravelly loam, 0 to 8 percent slopes--4 percent  
 Inclusion 3: Kelk silt loam, 0 to 2 percent slopes, occasionally flooded--4 percent  
 Inclusion 4: Shabliss stony loam, 8 to 15 percent slopes--2 percent

***Map Unit Setting***

*Landscape position:* Fan piedmonts  
 Bioya--Landform: Fan remnants; geomorphic position: backslope  
 Shabliss--Landform: Fan remnants; geomorphic position: summit  
 Puett--Landform: Pediments; geomorphic position: backslope; aspect: south  
 Inclusion 1--Landform: Pediments; geomorphic position: backslope  
 Inclusion 2--Landform: Inset fans  
 Inclusion 3--Landform: Inset fans  
 Inclusion 4--Landform: Fan remnants; geomorphic position: shoulder

***Major Component Description******Bioya Series***

*Elevation:* 5,100 to 5,300 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Very fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from volcanic rocks, loess and volcanic ash

***Shabliss Series***

*Elevation:* 5,100 to 5,300 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Very fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

***Puett Series***

*Elevation:* 5,100 to 5,300 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 48 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Stony sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from tuffaceous rocks

***Dominant Present Vegetation***

Bioya: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass  
 Shabliss: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail  
 Puett: Wyoming big sagebrush, bluegrass, rabbitbrush  
 Inclusion 1: None  
 Inclusion 2: Thurber needlegrass, big sagebrush  
 Inclusion 3: Basin big sagebrush, basin wildrye, rubber rabbitbrush  
 Inclusion 4: Thurber needlegrass, big sagebrush

***Ecological Site***

Bioya: 024XY005NV  
 Shabliss: 024XY005NV  
 Puett: 025XY025NV  
 Inclusion 1: None  
 Inclusion 2: 024XY005NV  
 Inclusion 3: 024XY006NV  
 Inclusion 4: 024XY005NV

**235--Bioya-Trunk-Alley association*****Composition******Major Components***

Bioya loam, 2 to 8 percent slopes--40 percent  
 Trunk gravelly loam, 30 to 50 percent slopes--30 percent



Alley very stony loam, 15 to 30 percent slopes--25 percent

**Contrasting Inclusions**

Inclusion 1: Bioya very stony loam, 2 to 8 percent slopes--5 percent

**Map Unit Setting**

*Landscape position:* Plateaus

Bioya--Landform: Plateaus; geomorphic position: summit

Trunk--Landform: Plateaus; geomorphic position: backslope

Alley--Landform: Plateaus; geomorphic position: backslope

Inclusion 1--Landform: Plateaus; geomorphic position: shoulder

**Major Component Description**

**Bioya Series**

*Elevation:* 4,800 to 5,500 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from volcanic rocks, loess and volcanic ash

**Trunk Series**

*Elevation:* 4,800 to 5,500 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

**Alley Series**

*Elevation:* 4,800 to 5,500 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Very stony loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

**Dominant Present Vegetation**

Bioya: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Trunk: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Alley: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Inclusion 1: Big sagebrush, cheatgrass

**Ecological Site**

Bioya: 025XY019NV

Trunk: 025XY019NV

Alley: 025XY019NV

Inclusion 1: 025XY019NV

**236--Bioya-Wieland-Kleckner association**

**Composition**

**Major Components**

Bioya very fine sandy loam, 0 to 2 percent slopes--45 percent

Wieland loam, 2 to 8 percent slopes--20 percent

Kleckner gravelly loam, 2 to 8 percent slopes--20 percent

**Contrasting Inclusions**

Inclusion 1: Clurde very fine sandy loam, 0 to 2 percent slopes--5 percent

Inclusion 2: Shabliss very fine sandy loam, 0 to 2 percent slopes--4 percent

Inclusion 3: Durixerollic Camborthids, coarse-silty, mixed, mesic fine sandy loam, 0 to 2 percent slopes--3 percent

Inclusion 4: Hunnton silt loam, 2 to 8 percent slopes--3 percent

**Map Unit Setting**

*Landscape position:* Fan piedmonts

Bioya--Landform: Fan remnants; geomorphic position: summit; position on slope: lower part

Wieland--Landform: Fan remnants; geomorphic position: summit

Kleckner--Landform: Fan remnants; geomorphic position: summit; position on slope: upper part

Inclusion 1--Landform: Fan remnants; geomorphic position: footslope

Inclusion 2--Landform: Fan remnants; geomorphic position: summit; position on slope: lower part

Inclusion 3--Landform: Inset fans

Inclusion 4--Landform: Fan remnants; geomorphic position: summit

**Major Component Description**

**Bioya Series**

*Elevation:* 5,100 to 5,200 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Very fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from volcanic rocks, loess and volcanic ash

**Wieland Series**

*Elevation:* 5,200 to 5,300 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

**Kleckner Series**

*Elevation:* 5,300 to 5,400 feet



*Precipitation:* About 11 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

#### ***Dominant Present Vegetation***

Bioya: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass  
 Wieland: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass  
 Kleckner: Big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass  
 Inclusion 1: Big sagebrush, cheatgrass  
 Inclusion 2: Big sagebrush, cheatgrass  
 Inclusion 3: Basin big sagebrush, basin wildrye, rabbitbrush  
 Inclusion 4: Big sagebrush, cheatgrass

#### ***Ecological Site***

Bioya: 025XY019NV  
 Wieland: 025XY019NV  
 Kleckner: 025XY014NV  
 Inclusion 1: 025XY019NV  
 Inclusion 2: 025XY019NV  
 Inclusion 3: 025XY031NV  
 Inclusion 4: 025XY019NV

### **241--Wickahoney-Deunah-Petan association**

#### ***Composition***

##### ***Major Components***

Wickahoney extremely stony loam, 2 to 8 percent slopes--50 percent  
 Deunah loam, 2 to 4 percent slopes--20 percent  
 Petan very cobbly loam, 4 to 8 percent slopes--20 percent

##### ***Contrasting Inclusions***

Inclusion 1: Typic Durixeralfs, clayey-skeletal, montmorillonitic, frigid very cobbly loam, 2 to 8 percent slopes--10 percent

#### ***Map Unit Setting***

*Landscape position:* Plateaus  
 Wickahoney--Landform: Plateaus; geomorphic position: summit  
 Deunah--Landform: Plateaus  
 Petan--Landform: Plateaus; geomorphic position: summit  
 Inclusion 1--Landform: Plateaus; geomorphic position: summit

#### ***Major Component Description***

##### ***Wickahoney Series***

*Elevation:* 5,400 to 5,700 feet  
*Precipitation:* About 14 inches  
*Air temperature:* About 43 degrees  
*Frost-free season:* About 85 days

*Surface layer texture:* Extremely stony loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum derived from volcanic rocks

##### ***Deunah Series***

*Elevation:* 5,400 to 5,700 feet  
*Precipitation:* About 14 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from volcanic rocks, loess and volcanic ash

##### ***Petan Series***

*Elevation:* 5,400 to 5,700 feet  
*Precipitation:* About 14 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Very cobbly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum derived from volcanic rocks

#### ***Dominant Present Vegetation***

Wickahoney: Idaho fescue, bluegrass, low sagebrush  
 Deunah: Idaho fescue, bluegrass, low sagebrush  
 Petan: Bluegrass, low sagebrush  
 Inclusion 1: Idaho fescue, low sagebrush

#### ***Ecological Site***

Wickahoney: 025XY017NV  
 Deunah: 025XY017NV  
 Petan: 025XY022NV  
 Inclusion 1: 025XY017NV

### **270--Pernty, steep-Loncan-Pernty association**

#### ***Composition***

##### ***Major Components***

Pernty very gravelly loam, 30 to 50 percent slopes--45 percent  
 Loncan very gravelly loam, 30 to 50 percent slopes--35 percent  
 Pernty very gravelly loam, 15 to 30 percent slopes--15 percent

##### ***Contrasting Inclusions***

Inclusion 1: Rock outcrop--2 percent  
 Inclusion 2: Rubble land fragmental material--2 percent  
 Inclusion 3: Typic Haplaquolls, sandy-skeletal, mixed, frigid very gravelly loam--1 percent

#### ***Map Unit Setting***

*Landscape position:* Mountains  
 Pernty--Landform: Mountains; geomorphic position: backslope  
 Loncan--Landform: Mountains; geomorphic position: backslope

Pernty--Landform: Mountains; geomorphic position: summit

Inclusion 1--Landform: Mountains; geomorphic position: summit

Inclusion 2--Landform: Mountains; geomorphic position: backslope

Inclusion 3--Landform: Drainageways

### ***Major Component Description***

#### **Pernty Series**

*Elevation:* 6,400 to 7,800 feet

*Precipitation:* About 12 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Very gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from sedimentary rocks

#### **Loncan Series**

*Elevation:* 6,400 to 7,800 feet

*Precipitation:* About 14 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Very gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

#### **Pernty Series**

*Elevation:* 6,400 to 7,800 feet

*Precipitation:* About 12 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Very gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from sedimentary rocks

### ***Dominant Present Vegetation***

Pernty: Antelope bitterbrush, bluebunch wheatgrass, mountain big sagebrush

Loncan: Idaho fescue, antelope bitterbrush, mountain big sagebrush

Pernty: Antelope bitterbrush, bluebunch wheatgrass, mountain big sagebrush

Inclusion 1: None

Inclusion 2: None

Inclusion 3: Nevada bluegrass, alpine timothy, basin wildrye

### ***Ecological Site***

Pernty: 025XY012NV

Loncan: 025XY012NV

Pernty: 025XY012NV

Inclusion 1: None

Inclusion 2: None

Inclusion 3: 025XY006NV

## **280--Humboldt silty clay loam, occasionally flooded**

### ***Composition***

#### ***Major Components***

Humboldt silty clay loam, 0 to 2 percent slopes--90 percent

#### ***Contrasting Inclusions***

Inclusion 1: Sonoma silty clay loam, 0 to 2 percent slopes--5 percent

Inclusion 2: Fluvaquent Haploxerolls, coarse-loamy, mixed, mesic silt loam, 0 to 2 percent slopes--4 percent

Inclusion 3: Humboldt silty clay loam, saline--1 percent

### ***Map Unit Setting***

*Landscape position:* Intermontane basins

Humboldt--Landform: Flood plains

Inclusion 1--Landform: Stream terraces; position on slope: upper part

Inclusion 2--Landform: Stream terraces

Inclusion 3--Landform: Stream terraces; shape of slope: convex

### ***Major Component Description***

#### **Humboldt Series**

*Elevation:* 4,500 to 4,600 feet

*Precipitation:* About 7 inches

*Air temperature:* About 48 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Silty clay loam

*Drainage class:* Poorly drained

*Dominant parent material:* Alluvium derived from mixed rocks

### ***Dominant Present Vegetation***

Humboldt: Alkali sacaton, black greasewood, inland saltgrass

Inclusion 1: Alkali sacaton, black greasewood, inland saltgrass

Inclusion 2: Basin wildrye, inland saltgrass

Inclusion 3: Basin wildrye, inland saltgrass

### ***Ecological Site***

Humboldt: 024XY007NV

Inclusion 1: 024XY007NV

Inclusion 2: 025XY001NV

Inclusion 3: 025XY001NV

## **308--Akler-Pattani-Cotant association**

### ***Composition***

#### ***Major Components***

Akler loam, 4 to 15 percent slopes--45 percent

Pattani clay, 4 to 15 percent slopes--30 percent

Cotant cobbly loam, 4 to 15 percent slopes--15 percent

#### ***Contrasting Inclusions***

Inclusion 1: Mahala loam, 8 to 15 percent slopes--4 percent



- Inclusion 2: Aridic Argixerolls, fine, montmorillonitic, frigid gravelly loam, 8 to 15 percent slopes--4 percent  
 Inclusion 3: Welch silt loam, 0 to 2 percent slopes, frequently flooded--1 percent  
 Inclusion 4: Welch silt loam, drained, 2 to 4 percent slopes, rarely flooded--1 percent

### ***Map Unit Setting***

- Landscape position:* Hills  
 Akler--Landform: Hills; geomorphic position: summit; position on slope: lower part  
 Pattani--Landform: Hills; geomorphic position: summit; position on slope: lower part  
 Cotant--Landform: Hills; geomorphic position: backslope; position on slope: upper part  
 Inclusion 1--Landform: Hills; geomorphic position: backslope  
 Inclusion 2--Landform: Hills; geomorphic position: backslope; shape of slope: concave; aspect: north  
 Inclusion 3--Landform: Drainageways  
 Inclusion 4--Landform: Drainageways

### ***Major Component Description***

#### **Akler Series**

- Elevation:* 5,000 to 6,500 feet  
*Precipitation:* About 12 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum derived from tuffaceous rocks

#### **Pattani Series**

- Elevation:* 5,000 to 6,500 feet  
*Precipitation:* About 11 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Clay  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum derived from tuffaceous rocks

#### **Cotant Series**

- Elevation:* 6,000 to 7,000 feet  
*Precipitation:* About 14 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Cobbly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum derived from tuffaceous rocks

### ***Dominant Present Vegetation***

- Akler: Bluegrass, bottlebrush squirreltail, low sagebrush  
 Pattani: Basin wildrye, big sagebrush, rabbitbrush  
 Cotant: Bluegrass, bottlebrush squirreltail, low sagebrush  
 Inclusion 1: Bluebunch wheatgrass, low sagebrush

- Inclusion 2: Big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass  
 Inclusion 3: Rush, sedge, tufted hairgrass, willow  
 Inclusion 4: Basin big sagebrush, basin wildrye, bluegrass, cheatgrass

### ***Ecological Site***

- Akler: 025XY018NV  
 Pattani: 025XY013NV  
 Cotant: 025XY017NV  
 Inclusion 1: 025XY018NV  
 Inclusion 2: 025XY014NV  
 Inclusion 3: 025XY005NV  
 Inclusion 4: 025XY003NV

## **309--Akler-Susie Creek association**

### ***Composition***

#### ***Major Components***

- Akler loam, 4 to 15 percent slopes--45 percent  
 Susie Creek loam, 4 to 15 percent slopes--40 percent

#### ***Contrasting Inclusions***

- Inclusion 1: Clementine silt loam, drained, 0 to 2 percent slopes--7 percent  
 Inclusion 2: Durargidic Argixerolls, fine-loamy, mixed, frigid loam, 8 to 15 percent slopes--5 percent  
 Inclusion 3: Bregar very gravelly sandy loam, 4 to 15 percent slopes--3 percent

### ***Map Unit Setting***

- Landscape position:* Hills  
 Akler--Landform: Hills; geomorphic position: summit; shape of slope: convex  
 Susie Creek--Landform: Hills; geomorphic position: summit; shape of slope: concave  
 Inclusion 1--Landform: Drainageways  
 Inclusion 2--Landform: Hills; geomorphic position: backslope; aspect: north  
 Inclusion 3--Landform: Hills; geomorphic position: summit; shape of slope: convex

### ***Major Component Description***

#### **Akler Series**

- Elevation:* 5,600 to 6,000 feet  
*Precipitation:* About 12 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum derived from tuffaceous rocks

#### **Susie Creek Series**

- Elevation:* 5,600 to 6,000 feet  
*Precipitation:* About 11 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 90 days  
*Surface layer texture:* Loam  
*Drainage class:* Well drained



*Dominant parent material:* Residuum derived from tuffaceous rocks

#### ***Dominant Present Vegetation***

Akler: Bluegrass, bottlebrush squirreltail, low sagebrush  
 Susie Creek: Basin big sagebrush, bluebunch wheatgrass, bluegrass, rabbitbrush  
 Inclusion 1: Basin big sagebrush, basin wildrye, bluegrass  
 Inclusion 2: Idaho fescue, basin big sagebrush, bluegrass  
 Inclusion 3: Bluegrass, bottlebrush squirreltail, low sagebrush

#### ***Ecological Site***

Akler: 025XY018NV  
 Susie Creek: 025XY014NV  
 Inclusion 1: 025XY003NV  
 Inclusion 2: 025XY027NV  
 Inclusion 3: 025XY051NV

### **457--Donna-Stampede-Short Creek association**

#### ***Composition***

##### ***Major Components***

Donna gravelly loam, 2 to 8 percent slopes--40 percent  
 Stampede gravelly loam, 4 to 15 percent slopes--25 percent  
 Short Creek gravelly clay loam, 30 to 50 percent slopes--20 percent

##### ***Contrasting Inclusions***

Inclusion 1: Pie Creek gravelly loam, 2 to 15 percent slopes--5 percent  
 Inclusion 2: Sumine very gravelly loam, 15 to 50 percent slopes--5 percent  
 Inclusion 3: Welch silt loam, drained, 0 to 2 percent slopes--5 percent

#### ***Map Unit Setting***

*Landscape position:* Fan piedmonts  
 Donna--Landform: Fan remnants; geomorphic position: summit; shape of slope: concave  
 Stampede--Landform: Fan remnants; geomorphic position: summit; shape of slope: convex  
 Short Creek--Landform: Fan remnants; geomorphic position: backslope; aspect: south  
 Inclusion 1--Landform: Pediments; geomorphic position: footslope; shape of slope: convex  
 Inclusion 2--Landform: Pediments; geomorphic position: backslope; aspect: south  
 Inclusion 3--Landform: Inset fans

#### ***Major Component Description***

##### ***Donna Series***

*Elevation:* 5,500 to 6,000 feet  
*Precipitation:* About 11 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

##### ***Stampede Series***

*Elevation:* 5,500 to 6,000 feet  
*Precipitation:* About 12 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 90 days  
*Surface layer texture:* Gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

##### ***Short Creek Series***

*Elevation:* 5,500 to 6,000 feet  
*Precipitation:* About 11 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 90 days  
*Surface layer texture:* Gravelly clay loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

#### ***Dominant Present Vegetation***

Donna: Bluegrass, bottlebrush squirreltail, low sagebrush  
 Stampede: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, rabbitbrush  
 Short Creek: Big sagebrush, bluebunch wheatgrass, bottlebrush squirreltail, cheatgrass  
 Inclusion 1: Bluebunch wheatgrass, bluegrass, low sagebrush  
 Inclusion 2: Antelope bitterbrush, bluebunch wheatgrass, mountain big sagebrush  
 Inclusion 3: Basin big sagebrush, basin wildrye, bluegrass

#### ***Ecological Site***

Donna: 025XY018NV  
 Stampede: 025XY014NV  
 Short Creek: 025XY015NV  
 Inclusion 1: 025XY018NV  
 Inclusion 2: 025XY009NV  
 Inclusion 3: 025XY003NV

### **458--Donna-Stampede association**

#### ***Composition***

##### ***Major Components***

Donna gravelly loam, 2 to 8 percent slopes--45 percent  
 Stampede gravelly loam, 4 to 15 percent slopes--40 percent

##### ***Contrasting Inclusions***

Inclusion 1: Short Creek gravelly clay loam, 30 to 50 percent slopes--10 percent  
 Inclusion 2: Gochea silt loam, 4 to 15 percent slopes--5 percent

**Map Unit Setting**

*Landscape position:* Fan piedmonts

Donna--Landform: Fan remnants; geomorphic position: summit; shape of slope: concave

Stampede--Landform: Fan remnants; geomorphic position: summit; shape of slope: convex

Inclusion 1--Landform: Fan remnants; geomorphic position: backslope; aspect: south

Inclusion 2--Landform: Fan remnants; geomorphic position: footslope

**Major Component Description****Donna Series**

*Elevation:* 5,700 to 6,400 feet

*Precipitation:* About 11 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

**Stampede Series**

*Elevation:* 5,700 to 6,400 feet

*Precipitation:* About 12 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 90 days

*Surface layer texture:* Gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

**Dominant Present Vegetation**

Donna: Bluegrass, bottlebrush squirreltail, low sagebrush

Stampede: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, rabbitbrush

Inclusion 1: Basin wildrye, big sagebrush, bluebunch wheatgrass, cheatgrass

Inclusion 2: Basin big sagebrush, bluebunch wheatgrass, cheatgrass

**Ecological Site**

Donna: 025XY018NV

Stampede: 025XY014NV

Inclusion 1: 025XY015NV

Inclusion 2: 025XY014NV

**464--Stampede silt loam, 2 to 8 percent slopes****Composition****Major Components**

Stampede silt loam, 2 to 8 percent slopes--85 percent

**Contrasting Inclusions**

Inclusion 1: Crooked Creek silty clay loam, drained, 0 to 2 percent slopes, rarely flooded--5 percent

Inclusion 2: Crooked Creek silty clay loam, 0 to 2 percent slopes, frequently flooded--5 percent

Inclusion 3: Bilbo gravelly loam, 15 to 30 percent slopes--3 percent

Inclusion 4: Donna loam, 2 to 8 percent slopes--2 percent

**Map Unit Setting**

*Landscape position:* Fan piedmonts

Stampede--Landform: Fan remnants; geomorphic position: summit

Inclusion 1--Landform: Inset fans

Inclusion 2--Landform: Inset fans

Inclusion 3--Landform: Fan remnants; geomorphic position: backslope; aspect: south

Inclusion 4--Landform: Fan remnants; geomorphic position: summit; shape of slope: concave

**Major Component Description****Stampede Series**

*Elevation:* 5,300 to 5,500 feet

*Precipitation:* About 12 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 90 days

*Surface layer texture:* Silt loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

**Dominant Present Vegetation**

Stampede: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, rabbitbrush

Inclusion 1: Basin big sagebrush, basin wildrye, bluegrass

Inclusion 2: Rush, sedge, tufted hairgrass, willow

Inclusion 3: Basin wildrye, big sagebrush, bluebunch wheatgrass, cheatgrass

Inclusion 4: Bluegrass, bottlebrush squirreltail, low sagebrush

**Ecological Site**

Stampede: 025XY014NV

Inclusion 1: 025XY003NV

Inclusion 2: 025XY005NV

Inclusion 3: 025XY015NV

Inclusion 4: 025XY018NV

**570--Sumine-Cleavage-Hapgood association****Composition****Major Components**

Sumine very gravelly loam, 15 to 50 percent slopes--40 percent

Cleavage extremely gravelly loam, 15 to 30 percent slopes--30 percent

Hapgood very gravelly loam, 30 to 50 percent slopes--15 percent

**Contrasting Inclusions**

Inclusion 1: Entic Cryumbrepts, loamy-skeletal, mixed very gravelly loam, 30 to 50 percent slopes--6 percent



Inclusion 2: Cumulic Haplaquolls, loamy-skeletal silt loam--4 percent

Inclusion 3: Bullump very gravelly loam, 15 to 50 percent slopes--3 percent

Inclusion 4: Entic Cryumbrepts, loamy-skeletal, mixed very gravelly loam--2 percent

### ***Map Unit Setting***

*Landscape position:* Mountains

Sumine--Landform: Mountains; geomorphic position: backslope; aspect: south

Cleavage--Landform: Mountains; geomorphic position: summit; position on slope: upper; shape of slope: convex

Hapgood--Landform: Mountains; geomorphic position: backslope; shape of slope: concave; aspect: north

Inclusion 1--Landform: Mountains; geomorphic position: backslope; aspect: north

Inclusion 2--Landform: Drainageways

Inclusion 3--Landform: Mountains; geomorphic position: backslope; position on slope: upper; aspect: south

Inclusion 4--Landform: Mountains; geomorphic position: backslope; position on slope: upper; shape of slope: concave; aspect: north

### ***Major Component Description***

#### **Sumine Series**

*Elevation:* 6,000 to 7,800 feet

*Precipitation:* About 12 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Very gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium and colluvium derived from tuffaceous rocks

#### **Cleavage Series**

*Elevation:* 6,000 to 7,800 feet

*Precipitation:* About 14 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Extremely gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from tuffaceous rocks

#### **Hapgood Series**

*Elevation:* 6,500 to 7,800 feet

*Precipitation:* About 18 inches

*Air temperature:* About 42 degrees

*Frost-free season:* About 60 days

*Surface layer texture:* Very gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Colluvium derived from tuffaceous rocks

### ***Dominant Present Vegetation***

Sumine: Antelope bitterbrush, bluebunch wheatgrass, cheatgrass, mountain big sagebrush

Cleavage: Idaho fescue, bluegrass, bottlebrush squirreltail, low sagebrush

Hapgood: Mountain brome, snowberry

Inclusion 1: Letterman needlegrass, mountain brome, quaking aspen

Inclusion 2: Rush, sedge, tufted hairgrass, willow

Inclusion 3: Antelope bitterbrush, basin wildrye, mountain big sagebrush, mountain brome

Inclusion 4: Letterman needlegrass, lupine

### ***Ecological Site***

Sumine: 025XY009NV

Cleavage: 025XY024NV

Hapgood: 025XY004NV

Inclusion 1: 025XY002NV

Inclusion 2: 025XY005NV

Inclusion 3: 025XY005NV

Inclusion 4: 025XY028NV

## **571--Sumine-Tusel-Gando association**

### ***Composition***

#### ***Major Components***

Sumine very gravelly loam, 15 to 50 percent slopes--50 percent

Tusel gravelly loam, 15 to 50 percent slopes--20 percent

Gando very gravelly loam, 8 to 30 percent slopes--15 percent

#### ***Contrasting Inclusions***

Inclusion 1: Rock outcrop--7 percent

Inclusion 2: Hackwood gravelly loam, 30 to 50 percent slopes--4 percent

Inclusion 3: Cleavage extremely gravelly loam, 15 to 50 percent slopes--2 percent

Inclusion 4: Rubble land fragmental material--2 percent

### ***Map Unit Setting***

*Landscape position:* Mountains

Sumine--Landform: Mountains; geomorphic position: backslope; aspect: south

Tusel--Landform: Mountains; geomorphic position: backslope; shape of slope: concave; aspect: north

Gando--Landform: Mountains; geomorphic position: summit; shape of slope: convex

Inclusion 1--Landform: Mountains; geomorphic position: summit

Inclusion 2--Landform: Mountains; geomorphic position: backslope; shape of slope: concave; aspect: north

Inclusion 3--Landform: Mountains; geomorphic position: summit; shape of slope: convex

Inclusion 4--Landform: Mountains; geomorphic position: backslope

### ***Major Component Description***

#### **Sumine Series**

*Elevation:* 6,400 to 6,800 feet

*Precipitation:* About 12 inches

*Air temperature:* About 44 degrees



*Frost-free season:* About 85 days  
*Surface layer texture:* Very gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

#### **Tusel Series**

*Elevation:* 6,400 to 6,800 feet  
*Precipitation:* About 18 inches  
*Air temperature:* About 42 degrees  
*Frost-free season:* About 60 days  
*Surface layer texture:* Gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

#### **Gando Series**

*Elevation:* 6,400 to 6,800 feet  
*Precipitation:* About 16 inches  
*Air temperature:* About 42 degrees  
*Frost-free season:* About 80 days  
*Surface layer texture:* Very gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from mixed rocks

#### ***Dominant Present Vegetation***

Sumine: Antelope bitterbrush, bluebunch wheatgrass, cheatgrass, mountain big sagebrush  
 Tusel: Idaho fescue, mountain brome, slender wheatgrass, snowberry  
 Gando: Bluegrass, bottlebrush squirreltail, low sagebrush  
 Inclusion 1: None  
 Inclusion 2: Mountain brome, quaking aspen, slender wheatgrass, sweetanise  
 Inclusion 3: Bluegrass, low sagebrush  
 Inclusion 4: None

#### ***Ecological Site***

Sumine: 025XY009NV  
 Tusel: 025XY010NV  
 Gando: 025XY024NV  
 Inclusion 1: None  
 Inclusion 2: 025XY065NV  
 Inclusion 3: 025XY024NV  
 Inclusion 4: None

### **572--Sumine-Reluctan-Cleavage association**

#### ***Composition***

#### ***Major Components***

Sumine very gravelly loam, 15 to 50 percent slopes--40 percent  
 Reluctan cobbly loam, 15 to 30 percent slopes--30 percent  
 Cleavage very gravelly loam, 8 to 15 percent slopes--15 percent

#### **Contrasting Inclusions**

Inclusion 1: Loncan very gravelly loam, 15 to 30 percent slopes--9 percent  
 Inclusion 2: Cotant cobbly loam, 4 to 15 percent slopes--3 percent  
 Inclusion 3: Cleavage extremely gravelly loam, 8 to 15 percent slopes--2 percent  
 Inclusion 4: Rock outcrop--1 percent

#### ***Map Unit Setting***

*Landscape position:* Hills  
 Sumine--Landform: Hills; geomorphic position: backslope; shape of slope: plane; aspect: south  
 Reluctan--Landform: Hills; geomorphic position: backslope; aspect: north  
 Cleavage--Landform: Hills; geomorphic position: summit  
 Inclusion 1--Landform: Hills; geomorphic position: backslope; shape of slope: convex; aspect: south  
 Inclusion 2--Landform: Hills; geomorphic position: footslope; position on slope: lower; shape of slope: convex  
 Inclusion 3--Landform: Hills; geomorphic position: summit; position on slope: upper part  
 Inclusion 4--Landform: Hills; geomorphic position: summit

#### ***Major Component Description***

#### **Sumine Series**

*Elevation:* 5,300 to 5,700 feet  
*Precipitation:* About 12 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Very gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

#### **Reluctan Series**

*Elevation:* 5,300 to 5,700 feet  
*Precipitation:* About 12 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface rock fragments:* 10 percent cobbles; 10 percent gravel  
*Surface layer texture:* Cobbly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

#### **Cleavage Series**

*Elevation:* 5,300 to 5,700 feet  
*Precipitation:* About 14 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Very gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum derived from volcanic rocks

***Dominant Present Vegetation***

Sumine: Antelope bitterbrush, bluebunch wheatgrass, cheatgrass, mountain big sagebrush  
 Reluctan: Bluegrass, bottlebrush squirreltail, mountain big sagebrush, rabbitbrush  
 Cleavage: Idaho fescue, bluegrass, bottlebrush squirreltail, low sagebrush  
 Inclusion 1: Idaho fescue, mountain big sagebrush  
 Inclusion 2: Idaho fescue, low sagebrush  
 Inclusion 3: Idaho fescue, black sagebrush  
 Inclusion 4: None

***Ecological Site***

Sumine: 025XY009NV  
 Reluctan: 025XY012NV  
 Cleavage: 025XY017NV  
 Inclusion 1: 025XY012NV  
 Inclusion 2: 025XY017NV  
 Inclusion 3: 025XY024NV  
 Inclusion 4: None

**576--Sumine-Hapgood-Cleavage association, very gravelly*****Composition******Major Components***

Sumine very gravelly loam, 30 to 50 percent slopes--35 percent  
 Hapgood very gravelly loam, 30 to 50 percent slopes--30 percent  
 Cleavage very gravelly loam, 15 to 50 percent slopes--20 percent

***Contrasting Inclusions***

Inclusion 1: Cleavage extremely gravelly loam, 4 to 15 percent slopes--5 percent  
 Inclusion 2: Welch silt loam, drained, 0 to 2 percent slopes, rarely flooded--4 percent  
 Inclusion 3: Bullump very gravelly loam, 30 to 50 percent slopes--4 percent  
 Inclusion 4: Lithic Argixerolls, loamy-skeletal, mixed, frigid very gravelly loam--2 percent

***Map Unit Setting***

*Landscape position:* Mountains  
 Sumine--Landform: Mountains; geomorphic position: backslope; aspect: south  
 Hapgood--Landform: Mountains; geomorphic position: backslope; shape of slope: concave; aspect: north  
 Cleavage--Landform: Mountains; geomorphic position: summit; shape of slope: convex  
 Inclusion 1--Landform: Mountains; geomorphic position: summit; position on slope: upper part  
 Inclusion 2--Landform: Drainageways  
 Inclusion 3--Landform: Mountains; position on slope: upper; aspect: south

Inclusion 4--Landform: Mountains; shape of slope: convex

***Major Component Description******Sumine Series***

*Elevation:* 6,100 to 7,200 feet  
*Precipitation:* About 12 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Very gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

***Hapgood Series***

*Elevation:* 6,100 to 7,200 feet  
*Precipitation:* About 18 inches  
*Air temperature:* About 42 degrees  
*Frost-free season:* About 60 days  
*Surface layer texture:* Very gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium and colluvium derived from volcanic rocks

***Cleavage Series***

*Elevation:* 6,100 to 7,200 feet  
*Precipitation:* About 14 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Very gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum derived from volcanic rocks

***Dominant Present Vegetation***

Sumine: Antelope bitterbrush, bluebunch wheatgrass, cheatgrass, mountain big sagebrush  
 Hapgood: Mountain brome, snowberry  
 Cleavage: Idaho fescue, bluegrass, bottlebrush squirreltail, low sagebrush  
 Inclusion 1: Idaho fescue, black sagebrush  
 Inclusion 2: Basin big sagebrush, basin wildrye, bluegrass  
 Inclusion 3: Antelope bitterbrush, basin wildrye, mountain big sagebrush, mountain brome  
 Inclusion 4: Bluegrass, bottlebrush squirreltail, serviceberry

***Ecological Site***

Sumine: 025XY009NV  
 Hapgood: 025XY004NV  
 Cleavage: 025XY017NV  
 Inclusion 1: 025XY024NV  
 Inclusion 2: 025XY003NV  
 Inclusion 3: 025XY016NV  
 Inclusion 4: 025XY046NV



**577--Sumine-Hapgood-Chen association****Composition****Major Components**

Sumine very gravelly loam, 30 to 50 percent slopes--40 percent

Hapgood very gravelly loam, 30 to 50 percent slopes--30 percent

Chen very gravelly loam, 15 to 50 percent slopes--15 percent

**Contrasting Inclusions**

Inclusion 1: Reluctan very gravelly loam, 30 to 50 percent slopes--10 percent

Inclusion 2: Welch silt loam, drained, 0 to 2 percent slopes, rarely flooded--3 percent

Inclusion 3: Lithic Torriorthents very gravelly loam--1 percent

Inclusion 4: Rock outcrop--1 percent

**Map Unit Setting**

*Landscape position:* Mountains

Sumine--Landform: Mountains; geomorphic position: backslope; aspect: south

Hapgood--Landform: Mountains; geomorphic position: backslope; shape of slope: concave; aspect: north

Chen--Landform: Mountains; geomorphic position: summit; shape of slope: convex

Inclusion 1--Landform: Mountains; geomorphic position: backslope; position on slope: lower; aspect: north

Inclusion 2--Landform: Drainageways

Inclusion 3--Landform: Mountains; geomorphic position: backslope

Inclusion 4--Landform: Mountains; geomorphic position: summit

**Major Component Description****Sumine Series**

*Elevation:* 6,500 to 6,900 feet

*Precipitation:* About 12 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Very gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

**Hapgood Series**

*Elevation:* 6,500 to 6,900 feet

*Precipitation:* About 18 inches

*Air temperature:* About 42 degrees

*Frost-free season:* About 60 days

*Surface layer texture:* Very gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium and colluvium derived from volcanic rocks

**Chen Series**

*Elevation:* 6,500 to 6,900 feet

*Precipitation:* About 12 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Very gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

**Dominant Present Vegetation**

Sumine: Antelope bitterbrush, bluebunch wheatgrass, cheatgrass, mountain big sagebrush

Hapgood: Mountain brome, snowberry

Chen: Bluegrass, bottlebrush squirreltail, low sagebrush

Inclusion 1: Bluegrass, mountain big sagebrush

Inclusion 2: Basin big sagebrush, basin wildrye, bluegrass

Inclusion 3: Bluegrass, bottlebrush squirreltail, mountain big sagebrush

Inclusion 4: None

**Ecological Site**

Sumine: 025XY009NV

Hapgood: 025XY004NV

Chen: 025XY017NV

Inclusion 1: 025XY012NV

Inclusion 2: 025XY003NV

Inclusion 3: 025XY042NV

Inclusion 4: None

**578--Sumine-Tusel-Hapgood association, very steep****Composition****Major Components**

Sumine very gravelly loam, 50 to 75 percent slopes--45 percent

Tusel gravelly loam, 50 to 75 percent slopes--25 percent

Hapgood very gravelly loam, 50 to 75 percent slopes--15 percent

**Contrasting Inclusions**

Inclusion 1: Cleavage extremely gravelly loam, 15 to 50 percent slopes--10 percent

Inclusion 2: Chen very gravelly loam, 15 to 30 percent slopes--3 percent

Inclusion 3: Welch silt loam, 2 to 4 percent slopes, frequently flooded--1 percent

Inclusion 4: Bullump very gravelly loam, 30 to 50 percent slopes--1 percent

**Map Unit Setting**

*Landscape position:* Mountains

Sumine--Landform: Mountains; geomorphic position: backslope; aspect: south

Tusel--Landform: Mountains; geomorphic position: backslope; shape of slope: convex; aspect: north

Hapgood--Landform: Mountains; geomorphic position: backslope; shape of slope: concave; aspect: north

Inclusion 1--Landform: Mountains; geomorphic position: summit; position on slope: upper part

Inclusion 2--Landform: Mountains; geomorphic position: summit; position on slope: lower part



Inclusion 3--Landform: Drainageways  
 Inclusion 4--Landform: Mountains; geomorphic  
 position: backslope; position on slope: upper;  
 aspect: south

### ***Major Component Description***

#### **Sumine Series**

*Elevation:* 5,600 to 7,400 feet  
*Precipitation:* About 12 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Very gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium  
 derived from quartzite

#### **Tusel Series**

*Elevation:* 5,600 to 7,400 feet  
*Precipitation:* About 18 inches  
*Air temperature:* About 42 degrees  
*Frost-free season:* About 60 days  
*Surface layer texture:* Gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium  
 derived from quartzite

#### **Hapgood Series**

*Elevation:* 5,600 to 7,400 feet  
*Precipitation:* About 18 inches  
*Air temperature:* About 42 degrees  
*Frost-free season:* About 60 days  
*Surface layer texture:* Very gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium and colluvium  
 derived from quartzite

### ***Dominant Present Vegetation***

Sumine: Antelope bitterbrush, bluebunch wheatgrass,  
 cheatgrass, mountain big sagebrush  
 Tusel: Idaho fescue, mountain brome, slender  
 wheatgrass, snowberry  
 Hapgood: Mountain brome, snowberry  
 Inclusion 1: Idaho fescue, bluegrass, low sagebrush  
 Inclusion 2: Bluegrass, bottlebrush squirreltail, low  
 sagebrush  
 Inclusion 3: Rush, sedge, tufted hairgrass, willow  
 Inclusion 4: Basin wildrye, mountain big sagebrush,  
 mountain brome

### ***Ecological Site***

Sumine: 025XY009NV  
 Tusel: 025XY010NV  
 Hapgood: 025XY004NV  
 Inclusion 1: 025XY024NV  
 Inclusion 2: 025XY017NV  
 Inclusion 3: 025XY005NV  
 Inclusion 4: 025XY016NV

## **579--Sumine-Pernty-Tusel association**

### ***Composition***

#### ***Major Components***

Sumine very gravelly loam, 30 to 50 percent slopes--  
 35 percent  
 Pernty very stony loam, 15 to 50 percent slopes--30  
 percent  
 Tusel very gravelly loam, 30 to 50 percent slopes--20  
 percent

#### ***Contrasting Inclusions***

Inclusion 1: Cleavage extremely gravelly loam, 15 to  
 50 percent slopes--9 percent  
 Inclusion 2: Rock outcrop--4 percent  
 Inclusion 3: Welch silt loam, 2 to 4 percent slopes,  
 frequently flooded--1 percent  
 Inclusion 4: Welch silt loam, drained, 2 to 4 percent  
 slopes, rarely flooded--1 percent

### ***Map Unit Setting***

*Landscape position:* Mountains  
 Sumine--Landform: Mountains; geomorphic position:  
 backslope; aspect: south  
 Pernty--Landform: Mountains; geomorphic position:  
 summit; shape of slope: convex  
 Tusel--Landform: Mountains; geomorphic position:  
 backslope; shape of slope: concave; aspect: north  
 Inclusion 1--Landform: Mountains; geomorphic  
 position: summit; shape of slope: convex  
 Inclusion 2--Landform: Mountains; geomorphic  
 position: summit  
 Inclusion 3--Landform: Drainageways  
 Inclusion 4--Landform: Drainageways

### ***Major Component Description***

#### **Sumine Series**

*Elevation:* 6,600 to 7,400 feet  
*Precipitation:* About 12 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Very gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium  
 derived from tuffaceous rocks

#### **Pernty Series**

*Elevation:* 6,600 to 7,400 feet  
*Precipitation:* About 12 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Very stony loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium  
 derived from tuffaceous rocks

#### **Tusel Series**

*Elevation:* 6,600 to 7,400 feet  
*Precipitation:* About 18 inches  
*Air temperature:* About 42 degrees  
*Frost-free season:* About 60 days  
*Surface layer texture:* Very gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from tuffaceous rocks

### ***Dominant Present Vegetation***

Sumine: Antelope bitterbrush, bluebunch wheatgrass, cheatgrass, mountain big sagebrush

Pernty: Antelope bitterbrush, bluebunch wheatgrass, mountain big sagebrush

Tusel: Idaho fescue, mountain brome, slender wheatgrass, snowberry

Inclusion 1: Idaho fescue, bluegrass, low sagebrush

Inclusion 2: None

Inclusion 3: Rush, sedge, tufted hairgrass, willow

Inclusion 4: Basin big sagebrush, basin wildrye, bluegrass

### ***Ecological Site***

Sumine: 025XY009NV

Pernty: 025XY046NV

Tusel: 025XY004NV

Inclusion 1: 025XY024NV

Inclusion 2: None

Inclusion 3: 025XY005NV

Inclusion 4: 025XY003NV

## **580--Sumine-Pie Creek-Reluctan association**

### ***Composition***

#### ***Major Components***

Sumine very gravelly loam, 15 to 30 percent slopes--40 percent

Pie Creek very cobbly silt loam, 4 to 15 percent slopes--25 percent

Reluctan gravelly loam, 15 to 30 percent slopes--20 percent

#### ***Contrasting Inclusions***

Inclusion 1: Typic Argixerolls, loamy-skeletal, mixed, frigid very gravelly loam--7 percent

Inclusion 2: Welch silt loam, 0 to 2 percent slopes, occasionally flooded--4 percent

Inclusion 3: Cleavage very gravelly loam, 15 to 30 percent slopes--4 percent

### ***Map Unit Setting***

*Landscape position:* Hills

Sumine--Landform: Hills; geomorphic position: backslope; aspect: south

Pie Creek--Landform: Hills; geomorphic position: summit

Reluctan--Landform: Hills; geomorphic position: backslope; aspect: north

Inclusion 1--Landform: Hills; geomorphic position: backslope; shape of slope: concave; aspect: north

Inclusion 2--Landform: Drainageways

Inclusion 3--Landform: Hills; geomorphic position: backslope; shape of slope: convex

### ***Major Component Description***

#### ***Sumine Series***

*Elevation:* 5,800 to 6,500 feet

*Precipitation:* About 12 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Very gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from tuffaceous rocks

#### ***Pie Creek Series***

*Elevation:* 5,800 to 6,500 feet

*Precipitation:* About 11 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Very cobbly silt loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from tuffaceous rocks

#### ***Reluctan Series***

*Elevation:* 5,800 to 6,300 feet

*Precipitation:* About 12 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from tuffaceous rocks

### ***Dominant Present Vegetation***

Sumine: Antelope bitterbrush, bluebunch wheatgrass, cheatgrass, mountain big sagebrush

Pie Creek: Bluegrass, bottlebrush squirreltail, low sagebrush

Reluctan: Bluegrass, bottlebrush squirreltail, mountain big sagebrush, rabbitbrush

Inclusion 1: Idaho fescue, bluebunch wheatgrass, mountain big sagebrush

Inclusion 2: Nevada bluegrass, alpine timothy

Inclusion 3: Bluegrass, bottlebrush squirreltail, low sagebrush

### ***Ecological Site***

Sumine: 025XY009NV

Pie Creek: 025XY018NV

Reluctan: 025XY012NV

Inclusion 1: 025XY012NV

Inclusion 2: 025XY006NV

Inclusion 3: 025XY017NV

## **581--Sumine-Hapgood-Cleavage association**

### ***Composition***

#### ***Major Components***

Sumine very gravelly loam, 30 to 50 percent slopes--35 percent

Hapgood very gravelly loam, 30 to 50 percent slopes--35 percent



Cleavage extremely gravelly loam, 15 to 50 percent slopes--15 percent

**Contrasting Inclusions**

Inclusion 1: Tusel very gravelly loam, 30 to 50 percent slopes--9 percent

Inclusion 2: Welch silt loam, 0 to 2 percent slopes, occasionally flooded--2 percent

Inclusion 3: Pachic Argixerolls, loamy-skeletal, mixed, frigid very gravelly loam--2 percent

Inclusion 4: Typic Haploxerolls, loamy-skeletal, mixed, frigid very gravelly loam--2 percent

**Map Unit Setting**

*Landscape position:* Mountains

Sumine--Landform: Mountains; geomorphic position: backslope; aspect: south

Hapgood--Landform: Mountains; geomorphic position: backslope; shape of slope: concave; aspect: north

Cleavage--Landform: Mountains; geomorphic position: summit; shape of slope: convex

Inclusion 1--Landform: Mountains; geomorphic position: backslope; shape of slope: concave; aspect: north

Inclusion 2--Landform: Drainageways

Inclusion 3--Landform: Mountains; geomorphic position: backslope; shape of slope: concave; aspect: north

Inclusion 4--Landform: Mountains; geomorphic position: backslope; position on slope: lower; aspect: north

**Major Component Description**

**Sumine Series**

*Elevation:* 6,500 to 7,850 feet

*Precipitation:* About 12 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Very gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from sedimentary rocks

**Hapgood Series**

*Elevation:* 6,500 to 7,850 feet

*Precipitation:* About 18 inches

*Air temperature:* About 42 degrees

*Frost-free season:* About 60 days

*Surface layer texture:* Very gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium and colluvium derived from mixed rocks

**Cleavage Series**

*Elevation:* 6,500 to 7,850 feet

*Precipitation:* About 14 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Extremely gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from sedimentary rocks

**Dominant Present Vegetation**

Sumine: Antelope bitterbrush, bluebunch wheatgrass, cheatgrass, mountain big sagebrush

Hapgood: Mountain brome, snowberry

Cleavage: Idaho fescue, bluegrass, bottlebrush squirreltail, low sagebrush

Inclusion 1: Idaho fescue, slender wheatgrass, snowberry

Inclusion 2: Nevada bluegrass, alpine timothy

Inclusion 3: Idaho fescue, basin wildrye

Inclusion 4: Idaho fescue, bluebunch wheatgrass, mountain big sagebrush

**Ecological Site**

Sumine: 025XY009NV

Hapgood: 025XY004NV

Cleavage: 025XY024NV

Inclusion 1: 025XY004NV

Inclusion 2: 025XY006NV

Inclusion 3: 025XY029NV

Inclusion 4: 025XY012NV

**582--Sumine-Tusel-Cleavage association**

**Composition**

**Major Components**

Sumine very gravelly loam, 30 to 50 percent slopes--45 percent

Tusel very gravelly loam, 30 to 50 percent slopes--25 percent

Cleavage very gravelly loam, 15 to 50 percent slopes--15 percent

**Contrasting Inclusions**

Inclusion 1: Typic Argixerolls, clayey-skeletal, montmorillonitic, frigid very gravelly loam, 30 to 50 percent slopes--5 percent

Inclusion 2: Bullump very gravelly loam, 30 to 50 percent slopes--4 percent

Inclusion 3: Cleavage extremely gravelly loam, 4 to 15 percent slopes--3 percent

Inclusion 4: Welch silt loam, drained, 2 to 4 percent slopes, rarely flooded--3 percent

**Map Unit Setting**

*Landscape position:* Mountains

Sumine--Landform: Mountains; geomorphic position: backslope; aspect: south

Tusel--Landform: Mountains; geomorphic position: backslope; aspect: north

Cleavage--Landform: Mountains; geomorphic position: summit; shape of slope: convex

Inclusion 1--Landform: Mountains; geomorphic position: backslope; shape of slope: concave

Inclusion 2--Landform: Mountains; geomorphic position: backslope; position on slope: upper part

Inclusion 3--Landform: Mountains; geomorphic position: summit; position on slope: upper part

Inclusion 4--Landform: Drainageways



**Major Component Description****Sumine Series**

*Elevation:* 6,200 to 7,000 feet  
*Precipitation:* About 12 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Very gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from sedimentary rocks

**Tusel Series**

*Elevation:* 6,200 to 7,000 feet  
*Precipitation:* About 18 inches  
*Air temperature:* About 42 degrees  
*Frost-free season:* About 60 days  
*Surface layer texture:* Very gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from sedimentary rocks

**Cleavage Series**

*Elevation:* 6,200 to 7,000 feet  
*Precipitation:* About 14 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Very gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum derived from quartzite

**Dominant Present Vegetation**

Sumine: Antelope bitterbrush, bluebunch wheatgrass, cheatgrass, mountain big sagebrush  
 Tusel: Idaho fescue, mountain brome, slender wheatgrass, snowberry  
 Cleavage: Idaho fescue, bluegrass, bottlebrush squirreltail, low sagebrush  
 Inclusion 1: Idaho fescue, mountain big sagebrush  
 Inclusion 2: Basin wildrye, mountain big sagebrush, mountain brome  
 Inclusion 3: Idaho fescue, black sagebrush  
 Inclusion 4: Basin big sagebrush, basin wildrye

**Ecological Site**

Sumine: 025XY009NV  
 Tusel: 025XY004NV  
 Cleavage: 025XY017NV  
 Inclusion 1: 025XY012NV  
 Inclusion 2: 025XY016NV  
 Inclusion 3: 025XY024NV  
 Inclusion 4: 025XY003NV

**583--Sumine-Hapgood-Pernty association****Composition****Major Components**

Sumine very gravelly loam, 50 to 75 percent slopes--40 percent

Hapgood very gravelly loam, 50 to 75 percent slopes--30 percent

Pernty very gravelly loam, 50 to 75 percent slopes--15 percent

**Contrasting Inclusions**

Inclusion 1: Cryic Lithic Rendolls, loamy-skeletal, carbonatic very gravelly loam, 30 to 50 percent slopes--5 percent

Inclusion 2: Lithic Argixerolls, clayey-skeletal, montmorillonitic, frigid very gravelly loam, 30 to 50 percent slopes--5 percent

Inclusion 3: Lithic Haploxerolls, loamy-skeletal, carbonatic, frigid very gravelly loam, 30 to 50 percent slopes--3 percent

Inclusion 4: Cryic Rendolls, loamy-skeletal, carbonatic very gravelly loam, 30 to 50 percent slopes--2 percent

**Map Unit Setting**

*Landscape position:* Mountains

Sumine--Landform: Mountains; geomorphic position: backslope; aspect: south

Hapgood--Landform: Mountains; geomorphic position: backslope; shape of slope: concave; aspect: north

Pernty--Landform: Mountains; geomorphic position: backslope; position on slope: lower; shape of slope: convex

Inclusion 1--Landform: Mountains; geomorphic position: backslope

Inclusion 2--Landform: Mountains; geomorphic position: backslope; aspect: south

Inclusion 3--Landform: Mountains; geomorphic position: backslope; position on slope: upper; aspect: south

Inclusion 4--Landform: Mountains; geomorphic position: backslope; position on slope: upper; aspect: north

**Major Component Description****Sumine Series**

*Elevation:* 5,800 to 8,300 feet  
*Precipitation:* About 12 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Very gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from mixed rocks

**Hapgood Series**

*Elevation:* 5,800 to 8,300 feet  
*Precipitation:* About 18 inches  
*Air temperature:* About 42 degrees  
*Frost-free season:* About 60 days  
*Surface layer texture:* Very gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium and colluvium derived from mixed rocks

**Pernty Series**

*Elevation:* 5,800 to 6,500 feet

*Precipitation:* About 12 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Very gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium  
 derived from mixed rocks

### ***Dominant Present Vegetation***

Sumine: Antelope bitterbrush, bluebunch wheatgrass, cheatgrass, mountain big sagebrush  
 Hapgood: Mountain brome, snowberry  
 Pernty: Antelope bitterbrush, bluebunch wheatgrass, mountain big sagebrush  
 Inclusion 1: Utah juniper, big sagebrush  
 Inclusion 2: Bluebunch wheatgrass, mountain big sagebrush  
 Inclusion 3: Basin wildrye, mountain big sagebrush, mountain brome  
 Inclusion 4: Idaho fescue, snowberry

### ***Ecological Site***

Sumine: 025XY009NV  
 Hapgood: 025XY004NV  
 Pernty: 025XY012NV  
 Inclusion 1: 025XY059NV  
 Inclusion 2: 025XY009NV  
 Inclusion 3: 025XY016NV  
 Inclusion 4: 025XY004NV

## **584--Sumine-Tusel-Hapgood association, steep**

### ***Composition***

#### ***Major Components***

Sumine very gravelly loam, 30 to 50 percent slopes--35 percent  
 Tusel very gravelly loam, 30 to 50 percent slopes--30 percent  
 Hapgood very gravelly loam, 50 to 75 percent slopes--20 percent

#### ***Contrasting Inclusions***

Inclusion 1: Typic Argixerolls, loamy-skeletal, mixed, frigid very gravelly loam, 8 to 50 percent slopes--8 percent  
 Inclusion 2: Bullump very gravelly loam, 30 to 50 percent slopes--3 percent  
 Inclusion 3: Welch silt loam, drained, 2 to 8 percent slopes, rarely flooded--2 percent  
 Inclusion 4: Lithic Argixerolls, loamy-skeletal, mixed, frigid very gravelly loam, 30 to 50 percent slopes--2 percent

### ***Map Unit Setting***

*Landscape position:* Mountains  
 Sumine--Landform: Mountains; geomorphic position: backslope; aspect: south  
 Tusel--Landform: Mountains; geomorphic position: backslope; shape of slope: convex; aspect: north

Hapgood--Landform: Mountains; geomorphic position: backslope; shape of slope: concave; aspect: north  
 Inclusion 1--Landform: Mountains; geomorphic position: summit; position on slope: lower part  
 Inclusion 2--Landform: Mountains; geomorphic position: backslope; position on slope: upper; aspect: south  
 Inclusion 3--Landform: Drainageways  
 Inclusion 4--Landform: Mountains; geomorphic position: backslope; position on slope: lower; aspect: south

### ***Major Component Description***

#### ***Sumine Series***

*Elevation:* 6,100 to 7,500 feet  
*Precipitation:* About 12 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Very gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium  
 derived from mixed rocks

#### ***Tusel Series***

*Elevation:* 6,100 to 7,500 feet  
*Precipitation:* About 18 inches  
*Air temperature:* About 42 degrees  
*Frost-free season:* About 60 days  
*Surface layer texture:* Very gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium  
 derived from mixed rocks

#### ***Hapgood Series***

*Elevation:* 6,100 to 7,500 feet  
*Precipitation:* About 18 inches  
*Air temperature:* About 42 degrees  
*Frost-free season:* About 60 days  
*Surface layer texture:* Very gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium and colluvium  
 derived from mixed rocks

### ***Dominant Present Vegetation***

Sumine: Antelope bitterbrush, bluebunch wheatgrass, cheatgrass, mountain big sagebrush  
 Tusel: Idaho fescue, mountain brome, slender wheatgrass, snowberry  
 Hapgood: Mountain brome, snowberry  
 Inclusion 1: Antelope bitterbrush, bluebunch wheatgrass, mountain big sagebrush  
 Inclusion 2: Basin wildrye, mountain big sagebrush, mountain brome  
 Inclusion 3: Basin big sagebrush, basin wildrye, bluegrass  
 Inclusion 4: Basin wildrye, big sagebrush, bluebunch wheatgrass, cheatgrass

### ***Ecological Site***

Sumine: 025XY009NV



Tusel: 025XY004NV  
 Hapgood: 025XY004NV  
 Inclusion 1: 025XY012NV  
 Inclusion 2: 025XY016NV  
 Inclusion 3: 025XY003NV  
 Inclusion 4: 025XY015NV

### **585--Sumine-Rock outcrop-Rubble land association**

#### ***Composition***

##### ***Major Components***

Sumine very gravelly loam, 30 to 50 percent slopes--40 percent  
 Rock outcrop--25 percent  
 Rubble land fragmental material, 30 to 50 percent slopes--20 percent

##### ***Contrasting Inclusions***

Inclusion 1: Pachic Haploxerolls, fine-loamy, mixed, frigid very gravelly loam, 4 to 15 percent slopes--5 percent  
 Inclusion 2: Gley very gravelly loam, 15 to 30 percent slopes--5 percent  
 Inclusion 3: Cumulic Haplaquolls silt loam, 0 to 4 percent slopes--3 percent  
 Inclusion 4: Hackwood silt loam, 4 to 15 percent slopes--2 percent

#### ***Map Unit Setting***

*Landscape position:* Mountains

Sumine--Landform: Mountains; geomorphic position: backslope; shape of slope: plane; aspect: south

Rock outcrop--Landform: Mountains; geomorphic position: summit

Rubble land--Landform: Mountains; geomorphic position: backslope

Inclusion 1--Landform: Mountains; geomorphic position: backslope; shape of slope: concave; aspect: north

Inclusion 2--Landform: Mountains; geomorphic position: backslope; shape of slope: convex; aspect: north

Inclusion 3--Landform: Drainageways

Inclusion 4--Landform: Mountains; geomorphic position: backslope; shape of slope: concave; aspect: north

#### ***Major Component Description***

##### ***Sumine Series***

*Elevation:* 6,000 to 7,000 feet

*Precipitation:* About 12 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Very gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from mixed rocks

##### ***Rock outcrop Miscellaneous Area***

*Elevation:* 6,000 to 7,000 feet

*Drainage class:* Excessively drained

##### ***Rubble land Miscellaneous Area***

*Elevation:* 6,000 to 7,000 feet

*Surface layer texture:* Fragmental material

*Drainage class:* Excessively drained

#### ***Dominant Present Vegetation***

Sumine: Antelope bitterbrush, bluebunch wheatgrass, cheatgrass, mountain big sagebrush

Rock outcrop: None

Rubble land: None

Inclusion 1: Snowbrush ceanothus

Inclusion 2: Antelope bitterbrush, bluebunch wheatgrass, mountain big sagebrush

Inclusion 3: Quaking aspen, rush, sedge, streambank wheatgrass, yarrow

Inclusion 4: Idaho fescue, mountain big sagebrush

#### ***Ecological Site***

Sumine: 025XY009NV

Rubble land: None

Rock outcrop: None

Inclusion 1: 025XY052NV

Inclusion 2: 025XY064NV

Inclusion 3: 025XY012NV

Inclusion 4: 025XY065NV

### **586--Sumine-Loncan-Cleavage association**

#### ***Composition***

##### ***Major Components***

Sumine very gravelly loam, 15 to 50 percent slopes--45 percent

Loncan very gravelly loam, 15 to 50 percent slopes--30 percent

Cleavage extremely gravelly loam, 8 to 15 percent slopes--15 percent

##### ***Contrasting Inclusions***

Inclusion 1: McIvey cobbly loam, 8 to 15 percent slopes--4 percent

Inclusion 2: Chen very cobbly loam, 4 to 15 percent slopes--4 percent

Inclusion 3: Rock outcrop--1 percent

Inclusion 4: Fluvaquent Haplaquolls, sandy-skeletal, mixed, frigid gravelly loam--1 percent

#### ***Map Unit Setting***

*Landscape position:* Mountains

Sumine--Landform: Mountains; geomorphic position: backslope; aspect: south

Loncan--Landform: Mountains; geomorphic position: backslope; aspect: north

Cleavage--Landform: Mountains; geomorphic position: summit

Inclusion 1--Landform: Mountains; geomorphic position: backslope; shape of slope: concave

Inclusion 2--Landform: Mountains; geomorphic position: backslope; position on slope: lower part

Inclusion 3--Landform: Mountains; geomorphic position: summit



## Inclusion 4--Landform: Drainageways

**Major Component Description****Sumine Series***Elevation:* 6,400 to 7,100 feet*Precipitation:* About 12 inches*Air temperature:* About 44 degrees*Frost-free season:* About 85 days*Surface layer texture:* Very gravelly loam*Drainage class:* Well drained*Dominant parent material:* Residuum and colluvium derived from sedimentary rocks**Loncan Series***Elevation:* 6,400 to 7,100 feet*Precipitation:* About 14 inches*Air temperature:* About 44 degrees*Frost-free season:* About 85 days*Surface layer texture:* Very gravelly loam*Drainage class:* Well drained*Dominant parent material:* Residuum and colluvium derived from sedimentary rocks**Cleavage Series***Elevation:* 6,600 to 7,100 feet*Precipitation:* About 14 inches*Air temperature:* About 44 degrees*Frost-free season:* About 85 days*Surface layer texture:* Extremely gravelly loam*Drainage class:* Well drained*Dominant parent material:* Residuum derived from sedimentary rocks**Dominant Present Vegetation**

Sumine: Antelope bitterbrush, bluebunch wheatgrass, cheatgrass, mountain big sagebrush

Loncan: Idaho fescue, antelope bitterbrush, mountain big sagebrush

Cleavage: Idaho fescue, bluegrass, bottlebrush squirreltail, low sagebrush

Inclusion 1: Bluebunch wheatgrass, mountain big sagebrush

Inclusion 2: Idaho fescue, low sagebrush

Inclusion 3: None

Inclusion 4: Nevada bluegrass, alpine timothy

**Ecological Site**

Sumine: 025XY009NV

Loncan: 025XY012NV

Cleavage: 025XY024NV

Inclusion 1: 025XY012NV

Inclusion 2: 025XY017NV

Inclusion 3: None

Inclusion 4: 025XY006NV

**600--Hapgood-Bullump-Gando association****Composition****Major Components**

Hapgood very gravelly loam, 30 to 50 percent slopes--30 percent

Bullump very gravelly loam, 15 to 50 percent slopes--30 percent

Gando very gravelly loam, 15 to 30 percent slopes--25 percent

**Contrasting Inclusions**

Inclusion 1: Hackwood very gravelly sandy loam, 30 to 50 percent slopes, frequently flooded--6 percent

Inclusion 2: Cumulic Haplaquolls, loamy-skeletal silt loam--4 percent

Inclusion 3: Entic Cryumbrepts, loamy-skeletal, mixed very gravelly loam, 30 to 50 percent slopes--3 percent

Inclusion 4: Cumulic Haplaquolls, loamy-skeletal silt loam--2 percent

**Map Unit Setting***Landscape position:* Mountains

Hapgood--Landform: Mountains; geomorphic position: backslope; shape of slope: concave; aspect: north

Bullump--Landform: Mountains; geomorphic position: backslope; aspect: south

Gando--Landform: Mountains; geomorphic position: summit

Inclusion 1--Landform: Mountains; geomorphic position: backslope; shape of slope: concave; aspect: north

Inclusion 2--Landform: Drainageways

Inclusion 3--Landform: Mountains; geomorphic position: backslope; shape of slope: convex; aspect: north

Inclusion 4--Landform: Drainageways

**Major Component Description****Hapgood Series***Elevation:* 6,500 to 7,700 feet*Precipitation:* About 18 inches*Air temperature:* About 42 degrees*Frost-free season:* About 60 days*Surface layer texture:* Very gravelly loam*Drainage class:* Well drained*Dominant parent material:* Alluvium and colluvium derived from mixed rocks**Bullump Series***Elevation:* 6,500 to 7,700 feet*Precipitation:* About 16 inches*Air temperature:* About 43 degrees*Frost-free season:* About 75 days*Surface layer texture:* Very gravelly loam*Drainage class:* Well drained*Dominant parent material:* Colluvium derived from mixed rocks**Gando Series***Elevation:* 6,800 to 7,700 feet

*Precipitation:* About 16 inches  
*Air temperature:* About 42 degrees  
*Frost-free season:* About 80 days  
*Surface layer texture:* Very gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium  
 derived from mixed rocks

### ***Dominant Present Vegetation***

Hapgood: Mountain brome, snowberry  
 Bullump: Idaho fescue, basin wildrye, bluebunch  
 wheatgrass, mountain brome  
 Gando: Bluegrass, bottlebrush squirreltail, low  
 sagebrush  
 Inclusion 1: Mountain brome, quaking aspen, slender  
 wheatgrass  
 Inclusion 2: Rush, sedge, tufted hairgrass, willow  
 Inclusion 3: Letterman needlegrass, mountain brome,  
 quaking aspen  
 Inclusion 4: Quaking aspen, rush, sedge, streambank  
 wheatgrass, yarrow

### ***Ecological Site***

Hapgood: 025XY004NV  
 Bullump: 025XY016NV  
 Gando: 025XY024NV  
 Inclusion 1: 025XY065NV  
 Inclusion 2: 025XY005NV  
 Inclusion 3: 025XY002NV  
 Inclusion 4: 025XY064NV

## **601--Hapgood-Blitzen-Tusel association**

### ***Composition***

#### ***Major Components***

Hapgood very gravelly loam, 30 to 75 percent slopes--  
 35 percent  
 Blitzen very gravelly loam, 30 to 75 percent slopes--35  
 percent  
 Tusel gravelly loam, 50 to 75 percent slopes--15  
 percent

#### ***Contrasting Inclusions***

Inclusion 1: Typic Argixerolls, loamy-skeletal, mixed,  
 frigid very gravelly loam, 15 to 50 percent slopes--5  
 percent  
 Inclusion 2: Cleavage very gravelly loam, 15 to 30  
 percent slopes--4 percent  
 Inclusion 3: Welch silt loam, drained, 2 to 4 percent  
 slopes, rarely flooded--3 percent  
 Inclusion 4: Welch silt loam, 0 to 2 percent slopes,  
 occasionally flooded--3 percent

### ***Map Unit Setting***

*Landscape position:* Hills  
 Hapgood--Landform: Hills; geomorphic position:  
 backslope; shape of slope: concave; aspect: north  
 Blitzen--Landform: Hills; geomorphic position:  
 backslope; aspect: south  
 Tusel--Landform: Hills; geomorphic position: backslope;  
 shape of slope: convex; aspect: north

Inclusion 1--Landform: Hills; geomorphic position:  
 toeslope; shape of slope: convex  
 Inclusion 2--Landform: Hills; geomorphic position:  
 summit; shape of slope: convex  
 Inclusion 3--Landform: Drainageways  
 Inclusion 4--Landform: Drainageways

### ***Major Component Description***

#### ***Hapgood Series***

*Elevation:* 5,800 to 6,400 feet  
*Precipitation:* About 18 inches  
*Air temperature:* About 42 degrees  
*Frost-free season:* About 60 days  
*Surface layer texture:* Very gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium and colluvium  
 derived from tuffaceous rocks

#### ***Blitzen Series***

*Elevation:* 5,800 to 6,400 feet  
*Precipitation:* About 13 inches  
*Air temperature:* About 43 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Very gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium  
 derived from tuffaceous rocks

#### ***Tusel Series***

*Elevation:* 5,800 to 6,400 feet  
*Precipitation:* About 18 inches  
*Air temperature:* About 42 degrees  
*Frost-free season:* About 60 days  
*Surface layer texture:* Gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium  
 derived from tuffaceous rocks

### ***Dominant Present Vegetation***

Hapgood: Mountain brome, snowberry  
 Blitzen: Basin wildrye, bluebunch wheatgrass,  
 mountain big sagebrush  
 Tusel: Idaho fescue, mountain brome, slender  
 wheatgrass, snowberry  
 Inclusion 1: Antelope bitterbrush, bluebunch  
 wheatgrass, mountain big sagebrush  
 Inclusion 2: Bluegrass, bottlebrush squirreltail, low  
 sagebrush  
 Inclusion 3: Basin big sagebrush, basin wildrye,  
 bluegrass  
 Inclusion 4: Nevada bluegrass, alpine timothy

### ***Ecological Site***

Hapgood: 025XY004NV  
 Blitzen: 025XY009NV  
 Tusel: 025XY010NV  
 Inclusion 1: 025XY012NV  
 Inclusion 2: 025XY017NV  
 Inclusion 3: 025XY003NV  
 Inclusion 4: 025XY006NV



**602--Hapgood-Hackwood-Tusel association****Composition****Major Components**

Hapgood very gravelly loam, 15 to 50 percent slopes--45 percent

Hackwood silt loam, 15 to 50 percent slopes--25 percent

Tusel gravelly loam, 30 to 75 percent slopes--15 percent

**Contrasting Inclusions**

Inclusion 1: Entic Cryumbrepts, loamy-skeletal, mixed very gravelly loam, 15 to 50 percent slopes--5 percent

Inclusion 2: Cumulic Haplaquolls silt loam, 4 to 30 percent slopes--4 percent

Inclusion 3: Rock outcrop--3 percent

Inclusion 4: Cleavage very gravelly loam, 15 to 50 percent slopes--3 percent

**Map Unit Setting**

*Landscape position:* Mountains

Hapgood--Landform: Mountains; geomorphic position: backslope; shape of slope: concave; aspect: north

Hackwood--Landform: Mountains; geomorphic position: backslope; shape of slope: concave; aspect: north

Tusel--Landform: Mountains; geomorphic position: backslope; shape of slope: convex; aspect: north

Inclusion 1--Landform: Mountains; geomorphic position: backslope; shape of slope: concave; aspect: north

Inclusion 2--Landform: Drainageways

Inclusion 3--Landform: Mountains; geomorphic position: summit

Inclusion 4--Landform: Mountains; geomorphic position: backslope; shape of slope: convex

**Major Component Description****Hapgood Series**

*Elevation:* 6,200 to 7,500 feet

*Precipitation:* About 18 inches

*Air temperature:* About 42 degrees

*Frost-free season:* About 60 days

*Surface layer texture:* Very gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium and colluvium derived from mixed rocks

**Hackwood Series**

*Elevation:* 6,200 to 7,500 feet

*Precipitation:* About 18 inches

*Air temperature:* About 42 degrees

*Frost-free season:* About 60 days

*Surface layer texture:* Silt loam

*Drainage class:* Well drained

*Dominant parent material:* Colluvium derived from mixed rocks

**Tusel Series**

*Elevation:* 6,200 to 7,500 feet

*Precipitation:* About 18 inches

*Air temperature:* About 42 degrees

*Frost-free season:* About 60 days

*Surface layer texture:* Gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from mixed rocks

**Dominant Present Vegetation**

Hapgood: Mountain brome, snowberry

Hackwood: Mountain brome, quaking aspen, slender wheatgrass

Tusel: Idaho fescue, mountain big sagebrush

Inclusion 1: Letterman needlegrass, mountain brome, quaking aspen

Inclusion 2: Quaking aspen, rush, sedge, streambank wheatgrass, yarrow

Inclusion 3: None

Inclusion 4: Idaho fescue, bluegrass, bottlebrush squirreltail, low sagebrush

**Ecological Site**

Hapgood: 025XY004NV

Hackwood: 025XY065NV

Tusel: 025XY010NV

Inclusion 1: 025XY002NV

Inclusion 2: 025XY064NV

Inclusion 3: None

Inclusion 4: 025XY017NV

**623--Soughe-Rock outcrop association****Composition****Major Components**

Soughe very cobbly loam, 15 to 30 percent slopes--60 percent

Rock outcrop--25 percent

**Contrasting Inclusions**

Inclusion 1: Aridic Argixerolls, loamy-skeletal, mixed, frigid gravelly loam, 15 to 30 percent slopes--5 percent

Inclusion 2: Soughe very gravelly loam, 15 to 30 percent slopes--5 percent

Inclusion 3: Welch silt loam, drained, 2 to 4 percent slopes, rarely flooded--3 percent

Inclusion 4: Weso very fine sandy loam, 2 to 8 percent slopes--2 percent

**Map Unit Setting**

*Landscape position:* Hills

Soughe--Landform: Hills; geomorphic position: summit

Rock outcrop--Landform: Hills; geomorphic position: summit

Inclusion 1--Landform: Hills; geomorphic position: backslope; aspect: north

Inclusion 2--Landform: Hills; geomorphic position: backslope; aspect: south

Inclusion 3--Landform: Drainageways

Inclusion 4--Landform: Hills; position on slope: lower part

**Major Component Description****Soughe Series***Elevation:* 4,800 to 5,600 feet*Precipitation:* About 9 inches*Air temperature:* About 47 degrees*Frost-free season:* About 100 days*Surface layer texture:* Very cobbly loam*Drainage class:* Well drained*Dominant parent material:* Residuum and colluvium derived from volcanic rocks**Rock outcrop Miscellaneous Area***Elevation:* 4,800 to 5,600 feet*Drainage class:* Excessively drained**Dominant Present Vegetation**

Soughe: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Rock outcrop: None

Inclusion 1: Big sagebrush, bluebunch wheatgrass, cheatgrass

Inclusion 2: Big sagebrush, bluebunch wheatgrass, cheatgrass

Inclusion 3: Basin big sagebrush, basin wildrye, bluegrass

Inclusion 4: Bottlebrush squirreltail, bud sagebrush, shadscale

**Ecological Site**

Soughe: 025XY019NV

Rock outcrop: None

Inclusion 1: 025XY014NV

Inclusion 2: 025XY015NV

Inclusion 3: 025XY003NV

Inclusion 4: 024XY002NV

**624--Soughe-Soughe, very steep-Rock outcrop association****Composition****Major Components**

Soughe very stony loam, 30 to 50 percent slopes--40 percent

Soughe very stony loam, 50 to 75 percent slopes--30 percent

Rock outcrop--15 percent

**Contrasting Inclusions**

Inclusion 1: Rubble land fragmental material--10 percent

Inclusion 2: Durixerollic Camborthids, loamy-skeletal, mixed, mesic fine sandy loam, 8 to 15 percent slopes--5 percent

**Map Unit Setting***Landscape position:* Plateaus

Soughe--Landform: Plateaus; geomorphic position: backslope

Soughe--Landform: Plateaus; geomorphic position: backslope; position on slope: upper part

Rock outcrop--Landform: Plateaus; geomorphic position: backslope

Inclusion 1--Landform: Plateaus; geomorphic position: backslope

Inclusion 2--Landform: Plateaus; geomorphic position: footslope

**Major Component Description****Soughe Variant***Elevation:* 5,200 to 5,400 feet*Precipitation:* About 9 inches*Air temperature:* About 47 degrees*Frost-free season:* About 100 days*Surface layer texture:* Very stony loam*Drainage class:* Well drained*Dominant parent material:* Residuum and colluvium derived from volcanic rocks**Soughe Series***Elevation:* 5,200 to 5,400 feet*Precipitation:* About 9 inches*Air temperature:* About 47 degrees*Frost-free season:* About 100 days*Surface layer texture:* Very stony loam*Drainage class:* Well drained*Dominant parent material:* Residuum and colluvium derived from volcanic rocks**Rock outcrop Miscellaneous Area***Elevation:* 5,200 to 5,400 feet*Drainage class:* Excessively drained**Dominant Present Vegetation**

Soughe: Wyoming big sagebrush, bluegrass, cheatgrass

Soughe: Wyoming big sagebrush, bluegrass, cheatgrass

Rock outcrop: None

Inclusion 1: None

Inclusion 2: Wyoming big sagebrush, bluegrass, cheatgrass

**Ecological Site**

Soughe: 025XY015NV

Soughe: 025XY015NV

Rock outcrop: None

Inclusion 1: None

Inclusion 2: 025XY019NV

**625--Soughe-Alyan-Shalper association****Composition****Major Components**

Soughe very cobbly loam, 30 to 50 percent slopes--40 percent

Alyan very gravelly loam, 15 to 50 percent slopes--30 percent

Shalper very gravelly loam, 4 to 15 percent slopes--15 percent

**Contrasting Inclusions**

Inclusion 1: Chen very gravelly loam, 15 to 30 percent slopes--7 percent



Inclusion 2: Rock outcrop--4 percent

Inclusion 3: Lithic Xerollic Haplargids, clayey-skeletal, montmorillonitic, frigid very gravelly loam, 4 to 15 percent slopes--2 percent

Inclusion 4: Aridic Haploxerolls, loamy-skeletal, mixed, frigid gravelly loam, 2 to 8 percent slopes--2 percent

### ***Map Unit Setting***

*Landscape position:* Hills

Soughe--Landform: Hills; geomorphic position: backslope; aspect: south

Alyan--Landform: Hills; geomorphic position: backslope; shape of slope: plane; aspect: north

Shalper--Landform: Hills; geomorphic position: summit

Inclusion 1--Landform: Hills; geomorphic position: backslope; position on slope: lower; shape of slope: convex

Inclusion 2--Landform: Hills; geomorphic position: summit

Inclusion 3--Landform: Hills; geomorphic position: summit; position on slope: lower part; shape of slope: convex

Inclusion 4--Landform: Hills; geomorphic position: backslope; shape of slope: concave

### ***Major Component Description***

#### ***Soughe Series***

*Elevation:* 5,500 to 6,300 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Very cobbly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

#### ***Alyan Series***

*Elevation:* 5,500 to 6,300 feet

*Precipitation:* About 12 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Very gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from tuffaceous rocks

#### ***Shalper Series***

*Elevation:* 5,600 to 6,300 feet

*Precipitation:* About 10 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Very gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from volcanic rocks

### ***Dominant Present Vegetation***

Soughe: Wyoming big sagebrush, bluebunch wheatgrass, bluegrass, cheatgrass

Alyan: Big sagebrush, bluebunch wheatgrass, bottlebrush squirreltail, cheatgrass

Shalper: Basin big sagebrush, bluebunch wheatgrass, bluegrass, bottlebrush squirreltail

Inclusion 1: Bluegrass, low sagebrush

Inclusion 2: None

Inclusion 3: Bluebunch wheatgrass, low sagebrush

Inclusion 4: Basin big sagebrush, basin wildrye, cheatgrass

### ***Ecological Site***

Soughe: 025XY015NV

Alyan: 025XY014NV

Shalper: 025XY021NV

Inclusion 1: 025XY017NV

Inclusion 2: None

Inclusion 3: 025XY022NV

Inclusion 4: 025XY003NV

## **626--Soughe, cobbly-Vanwyper-Soughe associaton**

### ***Composition***

#### ***Major Components***

Soughe cobbly loam, 15 to 30 percent slopes--35 percent

Vanwyper cobbly loam, 30 to 50 percent slopes--30 percent

Soughe very cobbly loam, 4 to 15 percent slopes--20 percent

#### ***Contrasting Inclusions***

Inclusion 1: Haploxerollic Durorthids, coarse-loamy, mixed, mesic cobbly loam, 2 to 8 percent slopes--5 percent

Inclusion 2: Xerollic Nadurargids, fine, montmorillonitic, mesic cobbly loam, 2 to 4 percent slopes--5 percent

Inclusion 3: Clementine silt loam, drained, 0 to 2 percent slopes--5 percent

### ***Map Unit Setting***

*Landscape position:* Plateaus

Soughe--Landform: Plateaus; geomorphic position: backslope

Vanwyper--Landform: Plateaus; geomorphic position: backslope; aspect: south

Soughe--Landform: Plateaus; geomorphic position: summit

Inclusion 1--Landform: Fan remnants; position on slope: lower part

Inclusion 2--Landform: Fan remnants

Inclusion 3--Landform: Drainageways

### ***Major Component Description***

#### ***Soughe Series***

*Elevation:* 4,800 to 5,800 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 100 days

*Surface layer texture:* Cobbly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

**Vanwyper Series***Elevation:* 4,800 to 5,800 feet*Precipitation:* About 10 inches*Air temperature:* About 47 degrees*Frost-free season:* About 110 days*Surface layer texture:* Cobbly loam*Drainage class:* Well drained*Dominant parent material:* Residuum and colluvium derived from volcanic rocks**Soughe Series***Elevation:* 4,800 to 5,800 feet*Precipitation:* About 9 inches*Air temperature:* About 47 degrees*Frost-free season:* About 100 days*Surface layer texture:* Very cobbly loam*Drainage class:* Well drained*Dominant parent material:* Residuum and colluvium derived from volcanic rocks***Dominant Present Vegetation***

Soughe: Wyoming big sagebrush

Vanwyper: Basin big sagebrush, big sagebrush, bluebunch wheatgrass

Soughe: Wyoming big sagebrush

Inclusion 1: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail

Inclusion 2: Wyoming big sagebrush, bottlebrush squirreltail, spiny hopsage

Inclusion 3: Basin big sagebrush, basin wildrye, rabbitbrush

***Ecological Site***

Soughe: 025XY019NV

Vanwyper: 025XY015NV

Soughe: 025XY019NV

Inclusion 1: 024XY005NV

Inclusion 2: 024XY020NV

Inclusion 3: 025XY003NV

**690--Welch, drained-Welch association*****Composition******Major Components***

Welch silt loam, drained, 2 to 4 percent slopes, rarely flooded--70 percent

Welch silt loam, 2 to 4 percent slopes, frequently flooded--15 percent

***Contrasting Inclusions***

Inclusion 1: Cumulic Haploxerolls, loamy-skeletal, mixed, frigid silt loam--5 percent

Inclusion 2: Welch silt loam, 0 to 2 percent slopes, occasionally flooded--5 percent

Inclusion 3: Crooked Creek silt loam, drained, 0 to 2 percent slopes, rarely flooded--5 percent

***Map Unit Setting****Landscape position:* Intermontane basins

Welch--Landform: Flood plains

Welch--Landform: Flood plains

Inclusion 1--Landform: Stream terraces; position on slope: upper part

Inclusion 2--Landform: Stream terraces; position on slope: lower part

Inclusion 3--Landform: Stream terraces

***Major Component Description*****Welch Series***Elevation:* 5,200 to 7,000 feet*Precipitation:* About 14 inches*Air temperature:* About 44 degrees*Frost-free season:* About 85 days*Surface layer texture:* Silt loam*Drainage class:* Very poorly drained*Dominant parent material:* Alluvium derived from mixed rocks**Welch Series***Elevation:* 5,200 to 7,000 feet*Precipitation:* About 14 inches*Air temperature:* About 44 degrees*Frost-free season:* About 85 days*Surface layer texture:* Silt loam*Drainage class:* Very poorly drained*Dominant parent material:* Alluvium derived from mixed rocks***Dominant Present Vegetation***

Welch: Basin big sagebrush, basin wildrye, bluegrass

Welch: Rush, sedge, tufted hairgrass, willow

Inclusion 1: Basin big sagebrush, basin wildrye, bluegrass

Inclusion 2: Nevada bluegrass, alpine timothy

Inclusion 3: Basin big sagebrush, basin wildrye, bluegrass

***Ecological Site***

Welch: 025XY003NV

Welch: 025XY005NV

Inclusion 1: 025XY003NV

Inclusion 2: 025XY006NV

Inclusion 3: 025XY003NV

**920--Bullump-Gando-Tusel association*****Composition******Major Components***

Bullump very gravelly loam, 30 to 50 percent slopes--45 percent

Gando very gravelly loam, 15 to 30 percent slopes--25 percent

Tusel gravelly loam, 30 to 50 percent slopes--15 percent

***Contrasting Inclusions***

Inclusion 1: Hackwood gravelly loam, 30 to 50 percent slopes--5 percent

Inclusion 2: Rock outcrop--5 percent



Inclusion 3: Entic Cryumbrepts, loamy-skeletal, mixed very gravelly loam, 30 to 50 percent slopes--3 percent

Inclusion 4: Welch silt loam, drained, 2 to 4 percent slopes, rarely flooded--2 percent

### ***Map Unit Setting***

*Landscape position:* Mountains

Bullump--Landform: Mountains; geomorphic position: backslope; aspect: south

Gando--Landform: Mountains; geomorphic position: summit; shape of slope: convex

Tusel--Landform: Mountains; geomorphic position: backslope; aspect: north

Inclusion 1--Landform: Mountains; geomorphic position: backslope; shape of slope: concave; aspect: north

Inclusion 2--Landform: Mountains; geomorphic position: summit

Inclusion 3--Landform: Mountains; geomorphic position: backslope; shape of slope: convex; aspect: north

Inclusion 4--Landform: Drainageways

### ***Major Component Description***

#### **Bullump Series**

*Elevation:* 6,600 to 7,200 feet

*Precipitation:* About 16 inches

*Air temperature:* About 43 degrees

*Frost-free season:* About 75 days

*Surface layer texture:* Very gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Colluvium derived from quartzite

#### **Gando Series**

*Elevation:* 6,600 to 7,200 feet

*Precipitation:* About 16 inches

*Air temperature:* About 42 degrees

*Frost-free season:* About 80 days

*Surface layer texture:* Very gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from mixed rocks

#### **Tusel Series**

*Elevation:* 6,600 to 7,200 feet

*Precipitation:* About 18 inches

*Air temperature:* About 42 degrees

*Frost-free season:* About 60 days

*Surface layer texture:* Gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from quartzite

### ***Dominant Present Vegetation***

Bullump: Idaho fescue, basin wildrye, bluebunch wheatgrass, mountain brome

Gando: Bluegrass, bottlebrush squirreltail, low sagebrush

Tusel: Idaho fescue, mountain brome, slender wheatgrass, snowberry

Inclusion 1: Mountain brome, slender wheatgrass

Inclusion 2: None

Inclusion 3: Letterman needlegrass, mountain brome, quaking aspen

Inclusion 4: Basin big sagebrush, basin wildrye, bluegrass

### ***Ecological Site***

Bullump: 025XY016NV

Gando: 025XY024NV

Tusel: 025XY010NV

Inclusion 1: 025XY065NV

Inclusion 2: None

Inclusion 3: 025XY002NV

Inclusion 4: 025XY003NV

## **921--Bullump-Hackwood-Cleavage association**

### ***Composition***

#### ***Major Components***

Bullump very gravelly loam, 30 to 50 percent slopes--40 percent

Hackwood silt loam, 15 to 50 percent slopes--25 percent

Cleavage extremely gravelly loam, 15 to 50 percent slopes--20 percent

#### ***Contrasting Inclusions***

Inclusion 1: Tusel very gravelly loam, 15 to 50 percent slopes--6 percent

Inclusion 2: Hapgood very gravelly loam, 30 to 50 percent slopes--4 percent

Inclusion 3: Entic Cryumbrepts, loamy-skeletal, mixed very gravelly loam, 15 to 50 percent slopes--4 percent

Inclusion 4: Entic Cryumbrepts, loamy-skeletal, mixed very gravelly loam--1 percent

### ***Map Unit Setting***

*Landscape position:* Mountains

Bullump--Landform: Mountains; geomorphic position: backslope; aspect: south

Hackwood--Landform: Mountains; geomorphic position: backslope; shape of slope: concave; aspect: north

Cleavage--Landform: Mountains; geomorphic position: summit; shape of slope: convex

Inclusion 1--Landform: Mountains; geomorphic position: summit; shape of slope: concave; aspect: north

Inclusion 2--Landform: Mountains; geomorphic position: backslope; shape of slope: concave; aspect: north

Inclusion 3--Landform: Mountains; geomorphic position: backslope; shape of slope: convex; aspect: north

Inclusion 4--Landform: Mountains; geomorphic position: summit; shape of slope: concave; aspect: north

**Major Component Description****Bullump Series***Elevation:* 6,800 to 8,400 feet*Precipitation:* About 16 inches*Air temperature:* About 43 degrees*Frost-free season:* About 75 days*Surface layer texture:* Very gravelly loam*Drainage class:* Well drained*Dominant parent material:* Colluvium derived from tuffaceous rocks**Hackwood Series***Elevation:* 6,800 to 8,400 feet*Precipitation:* About 18 inches*Air temperature:* About 42 degrees*Frost-free season:* About 60 days*Surface layer texture:* Silt loam*Drainage class:* Well drained*Dominant parent material:* Colluvium derived from volcanic rocks**Cleavage Series***Elevation:* 6,800 to 8,400 feet*Precipitation:* About 14 inches*Air temperature:* About 44 degrees*Frost-free season:* About 85 days*Surface layer texture:* Extremely gravelly loam*Drainage class:* Well drained*Dominant parent material:* Residuum derived from tuffaceous rocks**Dominant Present Vegetation**

Bullump: Idaho fescue, basin wildrye, bluebunch wheatgrass, mountain brome

Hackwood: Mountain brome, quaking aspen, slender wheatgrass

Cleavage: Idaho fescue, bluegrass, bottlebrush squirreltail, low sagebrush

Inclusion 1: Idaho fescue, mountain brome, slender wheatgrass, snowberry

Inclusion 2: Idaho fescue, mountain brome, slender wheatgrass, snowberry

Inclusion 3: Letterman needlegrass, mountain brome, quaking aspen

Inclusion 4: Letterman needlegrass, lupine

**Ecological Site**

Bullump: 025XY016NV

Hackwood: 025XY065NV

Cleavage: 025XY024NV

Inclusion 1: 025XY004NV

Inclusion 2: 025XY004NV

Inclusion 3: 025XY002NV

Inclusion 4: 025XY028NV

**922--Bullump-Cleavage-Hapgood association****Composition****Major Components**

Bullump very gravelly loam, 15 to 50 percent slopes--40 percent

Cleavage extremely gravelly loam, 15 to 50 percent slopes--30 percent

Hapgood very gravelly loam, 30 to 50 percent slopes--15 percent

**Contrasting Inclusions**

Inclusion 1: Entic Cryumbrepts, loamy-skeletal, mixed very gravelly loam, 30 to 50 percent slopes--5 percent

Inclusion 2: Tusel very gravelly loam, 30 to 50 percent slopes--5 percent

Inclusion 3: Hackwood silt loam, 30 to 50 percent slopes--3 percent

Inclusion 4: Argic Pachic Cryoborolls, loamy-skeletal, mixed gravelly loam, 15 to 50 percent slopes--2 percent

**Map Unit Setting***Landscape position:* Mountains

Bullump--Landform: Mountains; geomorphic position: backslope; aspect: south

Cleavage--Landform: Mountains; geomorphic position: summit; shape of slope: convex

Hapgood--Landform: Mountains; geomorphic position: backslope; shape of slope: concave; aspect: north

Inclusion 1--Landform: Mountains; geomorphic position: backslope; shape of slope: concave; aspect: north

Inclusion 2--Landform: Mountains; geomorphic position: backslope; shape of slope: concave; aspect: north

Inclusion 3--Landform: Mountains; geomorphic position: backslope; shape of slope: concave; aspect: north

Inclusion 4--Landform: Mountains; geomorphic position: backslope; aspect: north

**Major Component Description****Bullump Series***Elevation:* 6,600 to 8,600 feet*Precipitation:* About 16 inches*Air temperature:* About 43 degrees*Frost-free season:* About 75 days*Surface layer texture:* Very gravelly loam*Drainage class:* Well drained*Dominant parent material:* Colluvium derived from tuffaceous rocks**Cleavage Series***Elevation:* 6,600 to 8,600 feet*Precipitation:* About 14 inches*Air temperature:* About 44 degrees*Frost-free season:* About 85 days*Surface layer texture:* Extremely gravelly loam*Drainage class:* Well drained



*Dominant parent material:* Residuum derived from tuffaceous rocks

#### **Hapgood Series**

*Elevation:* 6,600 to 8,600 feet

*Precipitation:* About 18 inches

*Air temperature:* About 42 degrees

*Frost-free season:* About 60 days

*Surface layer texture:* Very gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium and colluvium derived from tuffaceous rocks

#### ***Dominant Present Vegetation***

Bullump: Idaho fescue, basin wildrye, bluebunch wheatgrass, mountain brome

Cleavage: Idaho fescue, bluegrass, bottlebrush squirreltail, low sagebrush

Hapgood: Mountain brome, snowberry

Inclusion 1: Letterman needlegrass, mountain brome, quaking aspen

Inclusion 2: Mountain brome, snowberry

Inclusion 3: Mountain brome, quaking aspen, slender wheatgrass

Inclusion 4: Idaho fescue, black sagebrush, bluegrass, bottlebrush squirreltail

#### ***Ecological Site***

Bullump: 025XY016NV

Cleavage: 025XY024NV

Hapgood: 025XY004NV

Inclusion 1: 025XY002NV

Inclusion 2: 025XY004NV

Inclusion 3: 025XY065NV

Inclusion 4: 024XY042NV

### **1130--Clementine silt loam, drained, 0 to 2 percent slopes**

#### ***Composition***

#### ***Major Components***

Clementine silt loam, drained, 0 to 2 percent slopes--90 percent

#### ***Contrasting Inclusions***

Inclusion 1: Hunnton silt loam, 2 to 8 percent slopes--5 percent

Inclusion 2: Wieland loam, 2 to 8 percent slopes--5 percent

#### ***Map Unit Setting***

*Landscape position:* Intermontane basins

Clementine--Landform: Flood plains

Inclusion 1--Landform: Fan remnants

Inclusion 2--Landform: Fan remnants

#### ***Major Component Description***

#### ***Clementine Series***

*Elevation:* 4,000 to 4,800 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Silt loam

*Drainage class:* Poorly drained

*Dominant parent material:* Alluvium derived from mixed rocks

#### ***Dominant Present Vegetation***

Clementine: Basin big sagebrush, basin wildrye, bluegrass

Inclusion 1: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Inclusion 2: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

#### ***Ecological Site***

Clementine: 025XY003NV

Inclusion 1: 025XY019NV

Inclusion 2: 025XY019NV

### **1131--Clementine, drained-Clementine, gently sloping-Clementine association**

#### ***Composition***

#### ***Major Components***

Clementine silt loam, drained, 0 to 2 percent slopes--60 percent

Clementine silt loam, drained, 2 to 4 percent slopes--15 percent

Clementine silt loam, 0 to 2 percent slopes--15 percent

#### ***Contrasting Inclusions***

Inclusion 1: Bioya loam, 2 to 8 percent slopes--5 percent

Inclusion 2: Cumulic Haplaquolls silt loam, 0 to 2 percent slopes--5 percent

#### ***Map Unit Setting***

*Landscape position:* Intermontane basins

Clementine--Landform: Flood plains

Clementine--Landform: Flood plains

Clementine--Landform: Flood plains

Inclusion 1--Landform: Fan remnants

Inclusion 2--Landform: Flood plains

#### ***Major Component Description***

#### ***Clementine Series***

*Elevation:* 4,000 to 5,000 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Silt loam

*Drainage class:* Poorly drained

*Dominant parent material:* Alluvium derived from mixed rocks

#### ***Clementine Series***

*Elevation:* 4,000 to 5,000 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Silt loam

*Drainage class:* Poorly drained

*Dominant parent material:* Alluvium derived from mixed rocks

#### **Clementine Series**

*Elevation:* 4,000 to 5,000 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Silt loam

*Drainage class:* Poorly drained

*Dominant parent material:* Alluvium derived from mixed rocks

#### ***Dominant Present Vegetation***

Clementine: Basin big sagebrush, basin wildrye, bluegrass, rabbitbrush

Clementine: Basin big sagebrush, basin wildrye, bluegrass, rabbitbrush

Clementine: Nevada bluegrass, tufted hairgrass, willow

Inclusion 1: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Inclusion 2: Big sagebrush, rabbitbrush, wildrye

#### ***Ecological Site***

Clementine: 025XY003NV

Clementine: 025XY003NV

Clementine: 025XY005NV

Inclusion 1: 025XY019NV

Inclusion 2: 025XY001NV

### **1135--Clementine-Clurde association**

#### ***Composition***

#### ***Major Components***

Clementine silt loam, drained, 0 to 2 percent slopes--60 percent

Clurde very fine sandy loam, 0 to 2 percent slopes--30 percent

#### ***Contrasting Inclusions***

Inclusion 1: Durixerollic Camborthids, fine-loamy over sandy or sandy-skeletal, mixed, mesic fine sandy loam, 0 to 2 percent slopes--4 percent

Inclusion 2: Kelk very fine sandy loam, 0 to 2 percent slopes, occasionally flooded--4 percent

Inclusion 3: Cumulic Haplaquolls, fine-loamy, mixed, mesic silt loam, drained--2 percent

#### ***Map Unit Setting***

*Landscape position:* Intermontane basins

Clementine--Landform: Flood plains

Clurde--Landform: Fan remnants

Inclusion 1--Landform: Flood plains

Inclusion 2--Landform: Flood plains

Inclusion 3--Landform: Flood plains

#### ***Major Component Description***

#### **Clementine Series**

*Elevation:* 5,100 to 5,500 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Silt loam

*Drainage class:* Poorly drained

*Dominant parent material:* Alluvium derived from mixed rocks

#### **Clurde Series**

*Elevation:* 5,100 to 5,500 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Very fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

#### ***Dominant Present Vegetation***

Clementine: Basin big sagebrush, basin wildrye, bluegrass, rabbitbrush

Clurde: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Inclusion 1: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Inclusion 2: Basin big sagebrush, basin wildrye, rabbitbrush

Inclusion 3: Basin big sagebrush, basin wildrye, bluegrass, rabbitbrush

#### ***Ecological Site***

Clementine: 025XY003NV

Clurde: 025XY019NV

Inclusion 1: 025XY019NV

Inclusion 2: 024XY006NV

Inclusion 3: 025XY003NV

### **1150--Clurde-Wieland association**

#### ***Composition***

#### ***Major Components***

Clurde very fine sandy loam, 2 to 8 percent slopes--50 percent

Wieland gravelly loam, 2 to 8 percent slopes--35 percent

#### ***Contrasting Inclusions***

Inclusion 1: Orovada fine sandy loam, 2 to 8 percent slopes--5 percent

Inclusion 2: Kleckner gravelly loam, 2 to 15 percent slopes--4 percent

Inclusion 3: Xeric Torriorthents, loamy-skeletal, mixed, nonacid, mesic gravelly loam, 2 to 8 percent slopes--3 percent

Inclusion 4: Welch silt loam, 0 to 2 percent slopes, frequently flooded--3 percent

#### ***Map Unit Setting***

*Landscape position:* Fan piedmonts

Clurde--Landform: Fan remnants; geomorphic position: summit; position on slope: lower part



Wieland--Landform: Fan remnants; geomorphic  
 position: summit; position on slope: upper part  
 Inclusion 1--Landform: Fan remnants; geomorphic  
 position: summit; position on slope: lower part  
 Inclusion 2--Landform: Fan remnants; geomorphic  
 position: summit; position on slope: upper part  
 Inclusion 3--Landform: Inset fans  
 Inclusion 4--Landform: Inset fans

### ***Major Component Description***

#### **Clurde Series**

*Elevation:* 4,800 to 5,500 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Very fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed  
 rocks, loess and volcanic ash

#### **Wieland Series**

*Elevation:* 4,800 to 5,500 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed  
 rocks, loess and volcanic ash

### ***Dominant Present Vegetation***

Clurde: Wyoming big sagebrush, bluegrass, bottlebrush  
 squirreltail, cheatgrass  
 Wieland: Wyoming big sagebrush, bluegrass,  
 cheatgrass  
 Inclusion 1: Wyoming big sagebrush, bluegrass,  
 bottlebrush squirreltail, cheatgrass  
 Inclusion 2: Big sagebrush, bluebunch wheatgrass,  
 cheatgrass  
 Inclusion 3: Wyoming big sagebrush, bluebunch  
 wheatgrass, cheatgrass  
 Inclusion 4: Rush, sedge, tufted hairgrass, willow

### ***Ecological Site***

Clurde: 025XY019NV  
 Wieland: 025XY019NV  
 Inclusion 1: 025XY019NV  
 Inclusion 2: 025XY014NV  
 Inclusion 3: 025XY019NV  
 Inclusion 4: 025XY005NV

**1155--Clurde very fine sandy loam, 0 to 2  
 percent slopes**

### ***Composition***

#### ***Major Components***

Clurde very fine sandy loam, 0 to 2 percent slopes--85  
 percent

### ***Contrasting Inclusions***

Inclusion 1: Durixerollic Camborthids, coarse-loamy,  
 mixed, mesic fine sandy loam, 0 to 2 percent  
 slopes--8 percent  
 Inclusion 2: Durixerollic Camborthids, fine-loamy over  
 sandy or sandy-skeletal, mixed, mesic fine sandy  
 loam, 0 to 2 percent slopes--3 percent  
 Inclusion 3: Kelk very fine sandy loam, 0 to 2 percent  
 slopes, occasionally flooded--2 percent  
 Inclusion 4: Zevadez very fine sandy loam, 0 to 2  
 percent slopes--2 percent

### ***Map Unit Setting***

*Landscape position:* Intermontane basins  
 Clurde--Landform: Fan remnants  
 Inclusion 1--Landform: Inset fans  
 Inclusion 2--Landform: Inset fans  
 Inclusion 3--Landform: Inset fans  
 Inclusion 4--Landform: Fan remnants; geomorphic  
 position: toeslope

### ***Major Component Description***

#### **Clurde Series**

*Elevation:* 5,100 to 5,500 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Very fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed  
 rocks, loess and volcanic ash

### ***Dominant Present Vegetation***

Clurde: Wyoming big sagebrush, bluegrass, cheatgrass  
 Inclusion 1: Wyoming big sagebrush, bluebunch  
 wheatgrass, cheatgrass  
 Inclusion 2: Wyoming big sagebrush, bluebunch  
 wheatgrass, cheatgrass  
 Inclusion 3: Basin big sagebrush, basin wildrye,  
 rabbitbrush  
 Inclusion 4: Wyoming big sagebrush, bluebunch  
 wheatgrass, cheatgrass

### ***Ecological Site***

Clurde: 025XY019NV  
 Inclusion 1: 025XY019NV  
 Inclusion 2: 025XY019NV  
 Inclusion 3: 024XY006NV  
 Inclusion 4: 025XY019NV

**1156--Clurde-Kortty association**

### ***Composition***

#### ***Major Components***

Clurde very fine sandy loam, 0 to 2 percent slopes--45  
 percent  
 Kortty silt loam, 0 to 2 percent slopes--40 percent

### ***Contrasting Inclusions***

Inclusion 1: Dacker very fine sandy loam, 0 to 2  
 percent slopes--5 percent

Inclusion 2: Shalake very fine sandy loam, 0 to 2 percent slopes--4 percent  
 Inclusion 3: Chiara very fine sandy loam, 0 to 2 percent slopes--4 percent  
 Inclusion 4: Typic Calciorthids, fine-loamy, mixed, mesic very gravelly loam, 0 to 2 percent slopes--2 percent

#### ***Map Unit Setting***

*Landscape position:* Fan piedmonts  
 Clurde--Landform: Fan remnants; geomorphic position: footslope  
 Kortty--Landform: Fan remnants; geomorphic position: summit  
 Inclusion 1--Landform: Fan remnants; geomorphic position: summit  
 Inclusion 2--Landform: Fan remnants; geomorphic position: backslope  
 Inclusion 3--Landform: Fan remnants; geomorphic position: backslope  
 Inclusion 4--Landform: Fan remnants; geomorphic position: footslope

#### ***Major Component Description***

##### **Clurde Series**

*Elevation:* 5,100 to 5,200 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Very fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

##### **Kortty Series**

*Elevation:* 5,100 to 5,200 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Silt loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

#### ***Dominant Present Vegetation***

Clurde: Wyoming big sagebrush, bluegrass, cheatgrass, squirreltail  
 Kortty: Bottlebrush squirreltail, bud sagebrush, shadscale  
 Inclusion 1: Wyoming big sagebrush, bluebunch wheatgrass, cheatgrass  
 Inclusion 2: Wyoming big sagebrush, bluebunch wheatgrass, cheatgrass  
 Inclusion 3: Wyoming big sagebrush, bluebunch wheatgrass, cheatgrass  
 Inclusion 4: Bottlebrush squirreltail, bud sagebrush, shadscale

#### ***Ecological Site***

Clurde: 025XY019NV  
 Kortty: 024XY002NV

Inclusion 1: 025XY019NV  
 Inclusion 2: 025XY019NV  
 Inclusion 3: 025XY019NV  
 Inclusion 4: 024XY002NV

### **1157--Clurde-Zevadez-Chiara association**

#### ***Composition***

##### ***Major Components***

Clurde very fine sandy loam, 0 to 2 percent slopes--40 percent  
 Zevadez very fine sandy loam, 0 to 2 percent slopes--25 percent  
 Chiara very fine sandy loam, 2 to 4 percent slopes--20 percent

##### ***Contrasting Inclusions***

Inclusion 1: Shalake very fine sandy loam, 0 to 2 percent slopes--10 percent  
 Inclusion 2: Xerollic Haplargids, fine, montmorillonitic, mesic gravelly loam, 0 to 2 percent slopes--5 percent

#### ***Map Unit Setting***

*Landscape position:* Fan piedmonts  
 Clurde--Landform: Fan remnants; geomorphic position: summit; shape of slope: concave  
 Zevadez--Landform: Fan remnants; shape of slope: concave  
 Chiara--Landform: Fan remnants; geomorphic position: summit; shape of slope: convex  
 Inclusion 1--Landform: Fan remnants; geomorphic position: summit; shape of slope: concave  
 Inclusion 2--Landform: Inset fans

#### ***Major Component Description***

##### **Clurde Series**

*Elevation:* 5,100 to 5,600 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Very fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

##### **Zevadez Series**

*Elevation:* 5,100 to 5,600 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Very fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

##### **Chiara Series**

*Elevation:* 5,100 to 5,600 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 105 days



*Surface layer texture:* Very fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

#### ***Dominant Present Vegetation***

Clurde: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Zevadez: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Chiara: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Inclusion 1: Wyoming big sagebrush, bluebunch wheatgrass, cheatgrass

Inclusion 2: Bluebunch wheatgrass, bluegrass, bottlebrush squirreltail

#### ***Ecological Site***

Clurde: 025XY019NV

Zevadez: 025XY019NV

Chiara: 025XY019NV

Inclusion 1: 025XY019NV

Inclusion 2: 025XY050NV

### **1190--Cherry Spring-Enko association**

#### ***Composition***

##### ***Major Components***

Cherry Spring very fine sandy loam, 2 to 8 percent slopes--50 percent

Enko very fine sandy loam, 2 to 8 percent slopes--40 percent

##### ***Contrasting Inclusions***

Inclusion 1: Wieland loam, 2 to 8 percent slopes--8 percent

Inclusion 2: Aeris Fluvaquents, coarse-loamy, mixed (calcareous), mesic loam, 0 to 2 percent slopes, occasionally flooded--2 percent

#### ***Map Unit Setting***

*Landscape position:* Fan piedmonts

Cherry Spring--Landform: Fan remnants; geomorphic position: summit; shape of slope: convex

Enko--Landform: Fan remnants; geomorphic position: summit; shape of slope: concave

Inclusion 1--Landform: Fan remnants; geomorphic position: summit; position on slope: upper part

Inclusion 2--Landform: Inset fans

#### ***Major Component Description***

##### ***Cherry Spring Series***

*Elevation:* 5,000 to 5,500 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Very fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

##### ***Enko Series***

*Elevation:* 5,000 to 5,500 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Very fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

#### ***Dominant Present Vegetation***

Cherry Spring: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Enko: Wyoming big sagebrush, bluegrass, cheatgrass

Inclusion 1: Bluegrass, bottlebrush squirreltail

Inclusion 2: Basin big sagebrush, basin wildrye, bluegrass

#### ***Ecological Site***

Cherry Spring: 025XY019NV

Enko: 025XY019NV

Inclusion 1: 025XY019NV

Inclusion 2: 025XY003NV

### **1191--Cherry Spring-Wieland association**

#### ***Composition***

##### ***Major Components***

Cherry Spring gravelly loam, 2 to 8 percent slopes--60 percent

Wieland gravelly loam, 8 to 15 percent slopes--30 percent

##### ***Contrasting Inclusions***

Inclusion 1: Shabliis gravelly loam, 2 to 8 percent slopes--5 percent

Inclusion 2: Durixerollic Haplargids, fine-loamy, mixed, mesic gravelly loam, 2 to 8 percent slopes--5 percent

#### ***Map Unit Setting***

*Landscape position:* Fan piedmonts

Cherry Spring--Landform: Fan remnants; geomorphic position: summit

Wieland--Landform: Fan remnants; geomorphic position: backslope

Inclusion 1--Landform: Fan remnants; geomorphic position: summit; shape of slope: convex

Inclusion 2--Landform: Fan remnants; geomorphic position: summit; position on slope: lower part

#### ***Major Component Description***

##### ***Cherry Spring Series***

*Elevation:* 5,000 to 6,000 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

**Wieland Series***Elevation:* 5,000 to 6,000 feet*Precipitation:* About 9 inches*Air temperature:* About 47 degrees*Frost-free season:* About 110 days*Surface layer texture:* Gravelly loam*Drainage class:* Well drained*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash***Dominant Present Vegetation***

Cherry Spring: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Wieland: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Inclusion 1: Wyoming big sagebrush, bottlebrush squirreltail

Inclusion 2: Wyoming big sagebrush, bottlebrush squirreltail

***Ecological Site***

Cherry Spring: 025XY019NV

Wieland: 025XY019NV

Inclusion 1: 025XY019NV

Inclusion 2: 025XY019NV

**1193--Cherry Spring-Hunnton-Chiara association*****Composition******Major Components***

Cherry Spring silt loam, 2 to 8 percent slopes--45 percent

Hunnton silt loam, 2 to 8 percent slopes--25 percent

Chiara silt loam, 2 to 8 percent slopes--20 percent

***Contrasting Inclusions***

Inclusion 1: Orovada silt loam--10 percent

***Map Unit Setting****Landscape position:* Fan piedmonts

Cherry Spring--Landform: Fan remnants; geomorphic position: summit; shape of slope: concave

Hunnton--Landform: Fan remnants; geomorphic position: summit

Chiara--Landform: Fan remnants; geomorphic position: summit; shape of slope: convex

Inclusion 1--Landform: Inset fans

***Major Component Description*****Cherry Spring Series***Elevation:* 5,000 to 5,500 feet*Precipitation:* About 9 inches*Air temperature:* About 47 degrees*Frost-free season:* About 110 days*Surface layer texture:* Silt loam*Drainage class:* Well drained*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash**Hunnton Series***Elevation:* 5,000 to 5,500 feet*Precipitation:* About 9 inches*Air temperature:* About 47 degrees*Frost-free season:* About 110 days*Surface layer texture:* Silt loam*Drainage class:* Well drained*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash**Chiara Series***Elevation:* 5,000 to 5,500 feet*Precipitation:* About 9 inches*Air temperature:* About 47 degrees*Frost-free season:* About 105 days*Surface layer texture:* Silt loam*Drainage class:* Well drained*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash***Dominant Present Vegetation***

Cherry Spring: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Hunnton: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Chiara: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Inclusion 1: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail

***Ecological Site***

Cherry Spring: 025XY019NV

Hunnton: 025XY019NV

Chiara: 025XY019NV

Inclusion 1: 025XY019NV

**1210--Skull Creek-Shabliss-Puett association*****Composition******Major Components***

Skull Creek very fine sandy loam, 2 to 8 percent slopes--45 percent

Shabliss very fine sandy loam, 2 to 8 percent slopes--25 percent

Puett sandy loam, 8 to 30 percent slopes--15 percent

***Contrasting Inclusions***

Inclusion 1: Rock outcrop--6 percent

Inclusion 2: Tweba very fine sandy loam, drained, 0 to 2 percent slopes, occasionally flooded--4 percent

Inclusion 3: Wieland loam, 2 to 8 percent slopes--4 percent

Inclusion 4: Xeric Torripsamments, mixed, mesic fine sand, 2 to 8 percent slopes--1 percent

***Map Unit Setting****Landscape position:* Fan piedmonts

Skull Creek--Landform: Fan remnants; geomorphic position: summit

Shabliss--Landform: Fan remnants; geomorphic position: backslope; shape of slope: concave



Puett--Landform: Pediments; geomorphic position: backslope; aspect: south

Inclusion 1--Landform: Fan remnants; geomorphic position: backslope; aspect: south

Inclusion 2--Landform: Inset fans

Inclusion 3--Landform: Fan remnants; geomorphic position: backslope; shape of slope: concave

Inclusion 4--Landform: Pediments; geomorphic position: backslope; shape of slope: concave

### ***Major Component Description***

#### **Skull Creek Series**

*Elevation:* 4,500 to 6,000 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Very fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

#### **Shabliss Series**

*Elevation:* 4,500 to 6,000 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Very fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

#### **Puett Series**

*Elevation:* 4,500 to 6,000 feet

*Precipitation:* About 9 inches

*Air temperature:* About 48 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from tuffaceous rocks

### ***Dominant Present Vegetation***

Skull Creek: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Shabliss: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail

Puett: Wyoming big sagebrush, bluegrass, rabbitbrush

Inclusion 1: None

Inclusion 2: Basin big sagebrush, basin wildrye

Inclusion 3: Wyoming big sagebrush, bottlebrush squirreltail

Inclusion 4: Indian ricegrass, basin big sagebrush, hairy horsebrush, rabbitbrush

### ***Ecological Site***

Skull Creek: 025XY019NV

Shabliss: 025XY019NV

Puett: 025XY025NV

Inclusion 1: None

Inclusion 2: 025XY003NV

Inclusion 3: 025XY019NV

Inclusion 4: 024XY001NV

## **1220--Hunnton, strongly sloping-Hunnton-Fulstone association**

### ***Composition***

#### ***Major Components***

Hunnton loam, 8 to 15 percent slopes--40 percent

Hunnton loam, 2 to 8 percent slopes--35 percent

Fulstone cobbly loam, 8 to 15 percent slopes--15 percent

#### ***Contrasting Inclusions***

Inclusion 1: Wieland loam, 2 to 8 percent slopes--5 percent

Inclusion 2: Fulstone cobbly loam, 2 to 8 percent slopes--5 percent

### ***Map Unit Setting***

*Landscape position:* Fan piedmonts

Hunnton--Landform: Fan remnants; geomorphic position: backslope; shape of slope: concave

Hunnton--Landform: Fan remnants; geomorphic position: summit; shape of slope: plane

Fulstone--Landform: Fan remnants; geomorphic position: backslope; shape of slope: convex

Inclusion 1--Landform: Fan remnants; geomorphic position: summit; shape of slope: concave

Inclusion 2--Landform: Fan remnants; geomorphic position: summit; shape of slope: convex

### ***Major Component Description***

#### **Hunnton Series**

*Elevation:* 5,500 to 6,000 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

#### **Hunnton Series**

*Elevation:* 5,500 to 6,000 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

#### **Fulstone Series**

*Elevation:* 5,500 to 6,000 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Cobbly loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

***Dominant Present Vegetation***

Hunnton: Wyoming big sagebrush, bluegrass,  
bottlebrush squirreltail, cheatgrass  
Hunnton: Wyoming big sagebrush, bluegrass,  
bottlebrush squirreltail, cheatgrass  
Fulstone: Bluegrass, bottlebrush squirreltail, low  
sagebrush  
Inclusion 1: Wyoming big sagebrush, bottlebrush  
squirreltail  
Inclusion 2: Bluegrass, bottlebrush squirreltail, low  
sagebrush

***Ecological Site***

Hunnton: 025XY019NV  
Hunnton: 025XY019NV  
Fulstone: 025XY018NV  
Inclusion 1: 025XY019NV  
Inclusion 2: 025XY018NV

**1221--Hunnton, moderately steep-Hunnton-Fulstone association*****Composition******Major Components***

Hunnton gravelly loam, 15 to 30 percent slopes--35  
percent  
Hunnton loam, 4 to 15 percent slopes--30 percent  
Fulstone gravelly loam, 15 to 30 percent slopes--20  
percent

***Contrasting Inclusions***

Inclusion 1: Skull Creek very fine sandy loam, 4 to 15  
percent slopes--7 percent  
Inclusion 2: Clementine silt loam, drained, 0 to 2  
percent slopes--5 percent  
Inclusion 3: Puett fine sandy loam, 15 to 30 percent  
slopes--3 percent

***Map Unit Setting***

*Landscape position:* Fan piedmonts  
Hunnton--Landform: Fan remnants; geomorphic  
position: backslope; shape of slope: plane  
Hunnton--Landform: Fan remnants; geomorphic  
position: summit; shape of slope: plane  
Fulstone--Landform: Fan remnants; geomorphic  
position: backslope; shape of slope: convex  
Inclusion 1--Landform: Fan remnants; geomorphic  
position: summit; shape of slope: convex  
Inclusion 2--Landform: Inset fans  
Inclusion 3--Landform: Pediments; geomorphic  
position: backslope; aspect: south

***Major Component Description******Hunnton Series***

*Elevation:* 5,500 to 6,000 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Gravelly loam  
*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed  
rocks, loess and volcanic ash

***Hunnton Series***

*Elevation:* 5,500 to 6,000 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed  
rocks, loess and volcanic ash

***Fulstone Series***

*Elevation:* 5,500 to 6,000 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed  
rocks

***Dominant Present Vegetation***

Hunnton: Wyoming big sagebrush, bluegrass,  
bottlebrush squirreltail, cheatgrass  
Hunnton: Wyoming big sagebrush, bluegrass,  
bottlebrush squirreltail, cheatgrass  
Fulstone: Bluegrass, bottlebrush squirreltail, low  
sagebrush  
Inclusion 1: Wyoming big sagebrush, bluegrass,  
bottlebrush squirreltail  
Inclusion 2: Basin big sagebrush, basin wildrye,  
bluegrass, rabbitbrush  
Inclusion 3: Wyoming big sagebrush, bluegrass,  
rabbitbrush

***Ecological Site***

Hunnton: 025XY019NV  
Hunnton: 025XY019NV  
Fulstone: 025XY018NV  
Inclusion 1: 025XY019NV  
Inclusion 2: 025XY003NV  
Inclusion 3: 025XY025NV

**1223--Hunnton-Shabliss-Puett association*****Composition******Major Components***

Hunnton gravelly loam, 8 to 15 percent slopes--40  
percent  
Shabliss very fine sandy loam, 2 to 8 percent slopes--  
25 percent  
Puett very cobbly loamy sand, 15 to 30 percent slopes  
--20 percent

***Contrasting Inclusions***

Inclusion 1: Xeric Torriorthents, fine-loamy, mixed,  
nonacid, mesic gravelly loam, 0 to 4 percent slopes  
--5 percent



Inclusion 2: Shabliss gravelly fine sandy loam, 15 to 30 percent slopes--5 percent  
 Inclusion 3: Rock outcrop--4 percent  
 Inclusion 4: Welch silt loam, 0 to 2 percent slopes, frequently flooded--1 percent

### ***Map Unit Setting***

*Landscape position:* Intermontane basins  
 Hunnnton--Landform: Fan remnants; geomorphic position: backslope; shape of slope: plane  
 Shabliss--Landform: Fan remnants; geomorphic position: summit  
 Puett--Landform: Pediments; geomorphic position: backslope; aspect: south  
 Inclusion 1--Landform: Inset fans  
 Inclusion 2--Landform: Fan remnants; geomorphic position: backslope; shape of slope: convex  
 Inclusion 3--Landform: Pediments; geomorphic position: backslope  
 Inclusion 4--Landform: Flood plains

### ***Major Component Description***

#### **Hunnnton Series**

*Elevation:* 4,800 to 6,000 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

#### **Shabliss Series**

*Elevation:* 4,800 to 6,000 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Very fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

#### **Puett Series**

*Elevation:* 4,800 to 6,000 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 48 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Very cobbly loamy sand  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from tuffaceous rocks

### ***Dominant Present Vegetation***

Hunnnton: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass  
 Shabliss: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail  
 Puett: Wyoming big sagebrush, bluegrass, rabbitbrush  
 Inclusion 1: Basin big sagebrush, inland saltgrass, rubber rabbitbrush

Inclusion 2: Wyoming big sagebrush, bottlebrush squirreltail  
 Inclusion 3: None  
 Inclusion 4: Rush, sedge, tufted hairgrass, willow

### ***Ecological Site***

Hunnnton: 025XY019NV  
 Shabliss: 025XY019NV  
 Puett: 025XY025NV  
 Inclusion 1: 024XY006NV  
 Inclusion 2: 025XY019NV  
 Inclusion 3: None  
 Inclusion 4: 025XY005NV

## **1224--Hunnnton-Trunk-Shabliss association**

### ***Composition***

#### ***Major Components***

Hunnnton loam, 15 to 30 percent slopes--35 percent  
 Trunk very cobbly loam, 30 to 50 percent slopes--25 percent  
 Shabliss gravelly loam, 4 to 15 percent slopes--25 percent

#### ***Contrasting Inclusions***

Inclusion 1: Typic Durorthids, loamy, mixed, mesic, shallow gravelly loam, 4 to 15 percent slopes--5 percent  
 Inclusion 2: Typic Durorthids, loamy, mixed, mesic, shallow gravelly loam, 15 to 30 percent slopes--4 percent  
 Inclusion 3: Lithic Xerollic Camborthids, loamy-skeletal, mixed, mesic very gravelly loam, 4 to 15 percent slopes--3 percent  
 Inclusion 4: Rock outcrop--3 percent

### ***Map Unit Setting***

*Landscape position:* Mountains and intermontane basins  
 Hunnnton--Landform: Fan remnants; geomorphic position: backslope  
 Trunk--Landform: Hills; geomorphic position: backslope; shape of slope: convex  
 Shabliss--Landform: Fan remnants; geomorphic position: summit  
 Inclusion 1--Landform: Fan remnants; geomorphic position: summit; shape of slope: convex  
 Inclusion 2--Landform: Fan remnants; geomorphic position: backslope; shape of slope: convex  
 Inclusion 3--Landform: Hills; shape of slope: convex  
 Inclusion 4--Landform: Hills; geomorphic position: backslope

### ***Major Component Description***

#### **Hunnnton Series**

*Elevation:* 4,800 to 5,100 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Loam  
*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

#### **Trunk Series**

*Elevation:* 4,800 to 5,100 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Very cobbly loam

*Drainage class:* Well drained

*Dominant parent material:* Residium and colluvium derived from mixed rocks

#### **Shabliss Series**

*Elevation:* 4,800 to 5,100 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

#### ***Dominant Present Vegetation***

Hunnton: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Trunk: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Shabliss: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail

Inclusion 1: Big sagebrush, bottlebrush squirreltail, shadscale

Inclusion 2: Big sagebrush, bottlebrush squirreltail, shadscale

Inclusion 3: Wyoming big sagebrush, bottlebrush squirreltail

Inclusion 4: None

#### ***Ecological Site***

Hunnton: 025XY019NV

Trunk: 025XY019NV

Shabliss: 025XY019NV

Inclusion 1: 024XY002NV

Inclusion 2: 024XY002NV

Inclusion 3: 025XY019NV

Inclusion 4: None

### **1226--Hunnton-Wieland-Clementine association**

#### ***Composition***

#### ***Major Components***

Hunnton gravelly loam, 2 to 8 percent slopes--40 percent

Wieland gravelly loam, 2 to 8 percent slopes--30 percent

Clementine silt loam, drained, 2 to 4 percent slopes--20 percent

#### **Contrasting Inclusions**

Inclusion 1: Chiara very fine sandy loam, 2 to 8 percent slopes--5 percent

Inclusion 2: Clurde very fine sandy loam, 2 to 8 percent slopes--3 percent

Inclusion 3: Xeric Torriorthents gravelly loam, 0 to 2 percent slopes--2 percent

#### ***Map Unit Setting***

*Landscape position:* Intermontane basins

Hunnton--Landform: Fan remnants; geomorphic position: summit; shape of slope: convex

Wieland--Landform: Fan remnants; geomorphic position: summit; shape of slope: plane

Clementine--Landform: Stream terraces

Inclusion 1--Landform: Fan remnants; geomorphic position: summit

Inclusion 2--Landform: Fan remnants; geomorphic position: backslope; shape of slope: plane

Inclusion 3--Landform: Inset fans

#### ***Major Component Description***

#### **Hunnton Series**

*Elevation:* 4,900 to 5,800 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

#### **Wieland Series**

*Elevation:* 4,900 to 5,800 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

#### **Clementine Series**

*Elevation:* 4,900 to 5,800 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Silt loam

*Drainage class:* Poorly drained

*Dominant parent material:* Alluvium derived from mixed rocks

#### ***Dominant Present Vegetation***

Hunnton: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Wieland: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Clementine: Basin big sagebrush, basin wildrye, bluegrass

Inclusion 1: Wyoming big sagebrush, bottlebrush squirreltail



Inclusion 2: Wyoming big sagebrush, bottlebrush squirreltail

Inclusion 3: Basin big sagebrush, basin wildrye, rabbitbrush

### ***Ecological Site***

Hunnton: 025XY019NV

Wieland: 025XY019NV

Clementine: 025XY003NV

Inclusion 1: 025XY019NV

Inclusion 2: 025XY019NV

Inclusion 3: 024XY006NV

## **1227--Hunnton-Chiara-Bilbo association**

### ***Composition***

#### ***Major Components***

Hunnton silt loam, 4 to 15 percent slopes--40 percent

Chiara silt loam, 4 to 15 percent slopes--25 percent

Bilbo cobbly loam, 15 to 30 percent slopes--20 percent

#### ***Contrasting Inclusions***

Inclusion 1: Orovada very gravelly loam, 4 to 15 percent slopes--10 percent

Inclusion 2: Xeric Torriorthents, loamy, mixed, mesic, shallow gravelly loam, 15 to 30 percent slopes--2 percent

Inclusion 3: Aridic Argixerolls, loamy-skeletal, mixed, frigid gravelly loam, 15 to 30 percent slopes--2 percent

Inclusion 4: Dewar loam, 4 to 15 percent slopes--1 percent

### ***Map Unit Setting***

*Landscape position:* Fan piedmonts

Hunnton--Landform: Fan remnants; geomorphic position: summit; shape of slope: plane

Chiara--Landform: Fan remnants; geomorphic position: summit; shape of slope: convex

Bilbo--Landform: Fan remnants; geomorphic position: backslope

Inclusion 1--Landform: Inset fans; aspect: south

Inclusion 2--Landform: Fan remnants; geomorphic position: shoulder; position on slope: lower part

Inclusion 3--Landform: Fan remnants; geomorphic position: backslope; position on slope: upper; aspect: north

Inclusion 4--Landform: Fan remnants; geomorphic position: summit; shape of slope: plane

### ***Major Component Description***

#### ***Hunnton Series***

*Elevation:* 5,300 to 5,800 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Silt loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

#### ***Chiara Series***

*Elevation:* 5,300 to 5,800 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 105 days

*Surface layer texture:* Silt loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

#### ***Bilbo Series***

*Elevation:* 5,300 to 5,800 feet

*Precipitation:* About 10 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Cobbly loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

### ***Dominant Present Vegetation***

Hunnton: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Chiara: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Bilbo: Cheatgrass, mountain big sagebrush

Inclusion 1: Big sagebrush, bluegrass, bottlebrush squirreltail

Inclusion 2: Wyoming big sagebrush, bluegrass, rabbitbrush

Inclusion 3: Big sagebrush, bluegrass

Inclusion 4: Big sagebrush, bluegrass, bottlebrush squirreltail

### ***Ecological Site***

Hunnton: 025XY019NV

Chiara: 025XY019NV

Bilbo: 025XY015NV

Inclusion 1: 025XY019NV

Inclusion 2: 025XY025NV

Inclusion 3: 025XY014NV

Inclusion 4: 025XY019NV

## **1228--Hunnton-Hunnton, moderately sloping association**

### ***Composition***

#### ***Major Components***

Hunnton silt loam, 2 to 8 percent slopes--65 percent

Hunnton silt loam, 8 to 15 percent slopes--20 percent

#### ***Contrasting Inclusions***

Inclusion 1: Lithic Xerollic Haplargids, loamy, montmorillonitic, mesic very gravelly loam, 2 to 8 percent slopes--10 percent

Inclusion 2: Gochea silt loam, 15 to 30 percent slopes--2 percent

Inclusion 3: Lithic Haplargids, clayey, montmorillonitic, mesic very gravelly loam, 30 to 50 percent slopes--2 percent

Inclusion 4: Chiara silt loam, 2 to 8 percent slopes--1 percent

### ***Map Unit Setting***

*Landscape position:* Fan piedmonts

Hunnton--Landform: Fan remnants; geomorphic position: summit; shape of slope: plane

Hunnton--Landform: Fan remnants; geomorphic position: backslope

Inclusion 1--Landform: Pediments; geomorphic position: shoulder

Inclusion 2--Landform: Fan remnants; geomorphic position: backslope; aspect: north

Inclusion 3--Landform: Pediments; geomorphic position: backslope; aspect: south

Inclusion 4--Landform: Fan remnants; geomorphic position: summit; shape of slope: convex

### ***Major Component Description***

#### **Hunnton Series**

*Elevation:* 5,300 to 5,500 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Silt loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

#### **Hunnton Series**

*Elevation:* 5,300 to 5,500 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Silt loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

### ***Dominant Present Vegetation***

Hunnton: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Hunnton: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Inclusion 1: Wyoming big sagebrush, bluegrass

Inclusion 2: Basin big sagebrush, bluebunch wheatgrass

Inclusion 3: Big sagebrush, bluebunch wheatgrass, cheatgrass

Inclusion 4: Wyoming big sagebrush, bluebunch wheatgrass

### ***Ecological Site***

Hunnton: 025XY019NV

Hunnton: 025XY019NV

Inclusion 1: 025XY019NV

Inclusion 2: 025XY014NV

Inclusion 3: 025XY015NV

Inclusion 4: 025XY019NV

## **1229--Hunnton-Chiara-Wieland association**

### ***Composition***

#### ***Major Components***

Hunnton silt loam, 2 to 8 percent slopes--40 percent

Chiara silt loam, 2 to 8 percent slopes--30 percent

Wieland silt loam, 4 to 15 percent slopes--15 percent

#### ***Contrasting Inclusions***

Inclusion 1: Enko very fine sandy loam, 2 to 8 percent slopes--5 percent

Inclusion 2: Stampede silt loam, 2 to 8 percent slopes--5 percent

Inclusion 3: Durixerollic Haplargids, loamy-skeletal, mixed, mesic loam, 4 to 15 percent slopes--3 percent

Inclusion 4: Durargidic Argixerolls, fine-loamy, mixed, frigid gravelly loam, 4 to 15 percent slopes--2 percent

### ***Map Unit Setting***

*Landscape position:* Fan piedmonts

Hunnton--Landform: Fan remnants; geomorphic position: summit; shape of slope: plane

Chiara--Landform: Fan remnants; geomorphic position: summit; shape of slope: convex

Wieland--Landform: Fan remnants; geomorphic position: backslope

Inclusion 1--Landform: Inset fans

Inclusion 2--Landform: Fan remnants; geomorphic position: summit; aspect: north

Inclusion 3--Landform: Fan remnants; geomorphic position: shoulder

Inclusion 4--Landform: Fan remnants; geomorphic position: backslope; aspect: north

### ***Major Component Description***

#### **Hunnton Series**

*Elevation:* 5,200 to 6,200 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Silt loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

#### **Chiara Series**

*Elevation:* 5,200 to 6,200 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 105 days

*Surface layer texture:* Silt loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

#### **Wieland Series**

*Elevation:* 5,200 to 6,200 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days



*Surface rock fragments:* 10 percent cobbles;  
*Surface layer texture:* Silt loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

#### ***Dominant Present Vegetation***

Hunnton: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass  
 Chiara: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass  
 Wieland: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass  
 Inclusion 1: Wyoming big sagebrush, bluebunch wheatgrass  
 Inclusion 2: Basin big sagebrush, bluebunch wheatgrass  
 Inclusion 3: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass  
 Inclusion 4: Idaho fescue, basin big sagebrush, bluebunch wheatgrass

#### ***Ecological Site***

Hunnton: 025XY019NV  
 Chiara: 025XY019NV  
 Wieland: 025XY019NV  
 Inclusion 1: 025XY019NV  
 Inclusion 2: 025XY014NV  
 Inclusion 3: 025XY019NV  
 Inclusion 4: 025XY027NV

### **1230--Fulstone-Hunnton association**

#### ***Composition***

##### ***Major Components***

Fulstone gravelly loam, 2 to 8 percent slopes--45 percent  
 Hunnton loam, 4 to 15 percent slopes--40 percent

##### ***Contrasting Inclusions***

Inclusion 1: Short Creek cobbly loam, 15 to 50 percent slopes--6 percent  
 Inclusion 2: Clementine silt loam, drained, 0 to 2 percent slopes--6 percent  
 Inclusion 3: Aridic Argixerolls, fine, montmorillonitic, mesic gravelly loam, 15 to 30 percent slopes--3 percent

#### ***Map Unit Setting***

*Landscape position:* Fan piedmonts  
 Fulstone--Landform: Fan remnants; geomorphic position: summit  
 Hunnton--Landform: Fan remnants; geomorphic position: backslope  
 Inclusion 1--Landform: Fan remnants; geomorphic position: backslope; aspect: south  
 Inclusion 2--Landform: Inset fans  
 Inclusion 3--Landform: Fan remnants; geomorphic position: backslope; aspect: north

#### ***Major Component Description***

##### ***Fulstone Series***

*Elevation:* 5,200 to 6,000 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

##### ***Hunnton Series***

*Elevation:* 5,200 to 6,000 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

#### ***Dominant Present Vegetation***

Fulstone: Bluegrass, bottlebrush squirreltail, low sagebrush  
 Hunnton: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass  
 Inclusion 1: Big sagebrush, bluebunch wheatgrass, cheatgrass  
 Inclusion 2: Basin big sagebrush, basin wildrye, bluegrass  
 Inclusion 3: Basin big sagebrush

#### ***Ecological Site***

Fulstone: 025XY018NV  
 Hunnton: 025XY019NV  
 Inclusion 1: 025XY015NV  
 Inclusion 2: 025XY003NV  
 Inclusion 3: 025XY014NV

### **1231--Fulstone-Fulstone, moderately steep-Hunnton association**

#### ***Composition***

##### ***Major Components***

Fulstone very cobbly silt loam, 4 to 15 percent slopes--40 percent  
 Fulstone very cobbly silt loam, 15 to 30 percent slopes--30 percent

Hunnton loam, 15 to 30 percent slopes--20 percent

##### ***Contrasting Inclusions***

Inclusion 1: Clementine silt loam, drained, 0 to 2 percent slopes--6 percent  
 Inclusion 2: Welch silt loam, 0 to 2 percent slopes, frequently flooded--3 percent  
 Inclusion 3: Aridic Argixerolls gravelly loam, 4 to 15 percent slopes--1 percent

#### ***Map Unit Setting***

*Landscape position:* Fan piedmonts

Fulstone--Landform: Fan remnants; geomorphic position: summit  
 Fulstone--Landform: Fan remnants; geomorphic position: backslope; shape of slope: convex  
 Hunnton--Landform: Fan remnants; geomorphic position: backslope; shape of slope: plane  
 Inclusion 1--Landform: Inset fans  
 Inclusion 2--Landform: Inset fans  
 Inclusion 3--Landform: Fan remnants; geomorphic position: summit; position on slope: upper; aspect: north

### ***Major Component Description***

#### **Fulstone Series**

*Elevation:* 5,200 to 6,000 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Very cobbly silt loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

#### **Fulstone Series**

*Elevation:* 5,200 to 6,000 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Very cobbly silt loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

#### **Hunnton Series**

*Elevation:* 5,200 to 6,000 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

### ***Dominant Present Vegetation***

Fulstone: Bluegrass, bottlebrush squirreltail, low sagebrush  
 Fulstone: Bluegrass, bottlebrush squirreltail, low sagebrush  
 Hunnton: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass  
 Inclusion 1: Basin big sagebrush, basin wildrye, bluegrass  
 Inclusion 2: Rush, sedge, tufted hairgrass, willow  
 Inclusion 3: Bluebunch wheatgrass, low sagebrush

### ***Ecological Site***

Fulstone: 025XY018NV  
 Fulstone: 025XY018NV  
 Hunnton: 025XY019NV  
 Inclusion 1: 025XY003NV  
 Inclusion 2: 025XY005NV

Inclusion 3: 025XY017NV

## **1232--Fulstone-Fulstone, cobbly loam-Wieland association**

### ***Composition***

#### ***Major Components***

Fulstone gravelly loam, 2 to 8 percent slopes--35 percent  
 Fulstone cobbly loam, 8 to 15 percent slopes--30 percent  
 Wieland loam, 8 to 15 percent slopes--20 percent

#### ***Contrasting Inclusions***

Inclusion 1: Bilbo gravelly very fine sandy loam, 30 to 50 percent slopes--7 percent  
 Inclusion 2: Clementine sandy loam, 0 to 2 percent slopes--5 percent  
 Inclusion 3: Crooked Creek silty clay loam, 2 to 4 percent slopes, frequently flooded--3 percent

### ***Map Unit Setting***

*Landscape position:* Intermontane basins  
 Fulstone--Landform: Fan remnants; geomorphic position: summit  
 Fulstone--Landform: Fan remnants; geomorphic position: backslope; shape of slope: convex  
 Wieland--Landform: Fan remnants; geomorphic position: backslope; shape of slope: plane  
 Inclusion 1--Landform: Fan remnants; geomorphic position: backslope; aspect: south  
 Inclusion 2--Landform: Stream terraces  
 Inclusion 3--Landform: Flood plains

### ***Major Component Description***

#### **Fulstone Series**

*Elevation:* 5,000 to 6,000 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

#### **Fulstone Series**

*Elevation:* 5,000 to 6,000 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Cobbly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

#### **Wieland Series**

*Elevation:* 5,000 to 6,000 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Loam



*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

#### ***Dominant Present Vegetation***

Fulstone: Bluegrass, bottlebrush squirreltail, low sagebrush

Fulstone: Bluegrass, bottlebrush squirreltail, low sagebrush

Wieland: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Inclusion 1: Big sagebrush, bluebunch wheatgrass, cheatgrass

Inclusion 2: Basin big sagebrush, basin wildrye, bluegrass

Inclusion 3: Rush, sedge, tufted hairgrass, willow

#### ***Ecological Site***

Fulstone: 025XY018NV

Fulstone: 025XY018NV

Wieland: 025XY019NV

Inclusion 1: 025XY015NV

Inclusion 2: 025XY003NV

Inclusion 3: 025XY005NV

### **1241--Enko-Shabliss-Orovada association**

#### ***Composition***

##### ***Major Components***

Enko fine sandy loam, 2 to 8 percent slopes--60 percent

Shabliss very fine sandy loam, 15 to 30 percent slopes--15 percent

Orovada very fine sandy loam, 2 to 8 percent slopes--15 percent

##### ***Contrasting Inclusions***

Inclusion 1: Xeric Torripsamments fine sand, 8 to 15 percent slopes--10 percent

#### ***Map Unit Setting***

*Landscape position:* Fan piedmonts

Enko--Landform: Fan remnants; geomorphic position: summit

Shabliss--Landform: Fan remnants; geomorphic position: backslope

Orovada--Landform: Inset fans

Inclusion 1--Landform: Fan remnants; geomorphic position: backslope; position on slope: upper part

#### ***Major Component Description***

##### ***Enko Series***

*Elevation:* 4,500 to 5,500 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

##### ***Shabliss Series***

*Elevation:* 4,500 to 5,500 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Very fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

##### ***Orovada Series***

*Elevation:* 4,500 to 5,500 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Very fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

#### ***Dominant Present Vegetation***

Enko: Bluegrass, cheatgrass, squirreltail

Shabliss: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail

Orovada: Thurber needlegrass, Wyoming big sagebrush, cheatgrass, rabbitbrush

Inclusion 1: Indian ricegrass, big sagebrush, rabbitbrush

#### ***Ecological Site***

Enko: 025XY019NV

Shabliss: 025XY019NV

Orovada: 024XY020NV

Inclusion 1: 024XY001NV

### **1242--Enko-Enko, strongly sloping association**

#### ***Composition***

##### ***Major Components***

Enko fine sandy loam, 0 to 2 percent slopes--65 percent

Enko fine sandy loam, 4 to 15 percent slopes--20 percent

##### ***Contrasting Inclusions***

Inclusion 1: Durixerollic Camborthids, coarse-silty, mixed, mesic fine sandy loam--8 percent

Inclusion 2: Wieland loam, 2 to 8 percent slopes--7 percent

#### ***Map Unit Setting***

*Landscape position:* Fan piedmonts

Enko--Landform: Fan remnants; geomorphic position: summit

Enko--Landform: Fan remnants; geomorphic position: backslope; shape of slope: plane

Inclusion 1--Landform: Fan remnants; geomorphic position: footslope

Inclusion 2--Landform: Fan remnants; geomorphic position: backslope; shape of slope: convex

**Major Component Description****Enko Series**

*Elevation:* 4,400 to 5,700 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

**Enko Series**

*Elevation:* 4,400 to 5,700 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

**Dominant Present Vegetation**

Enko: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass  
 Enko: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass  
 Inclusion 1: Wyoming big sagebrush, bottlebrush squirreltail  
 Inclusion 2: Wyoming big sagebrush, bottlebrush squirreltail

**Ecological Site**

Enko: 025XY019NV  
 Enko: 025XY019NV  
 Inclusion 1: 025XY019NV  
 Inclusion 2: 025XY019NV

**1260--Kleckner-Upville-Fulstone association****Composition****Major Components**

Kleckner gravelly loam, 8 to 15 percent slopes--40 percent  
 Upville gravelly loam, 2 to 4 percent slopes--30 percent  
 Fulstone very cobbly loam, 2 to 8 percent slopes--20 percent

**Contrasting Inclusions**

Inclusion 1: Crooked Creek silty clay loam, 2 to 4 percent slopes, frequently flooded--8 percent  
 Inclusion 2: Hunnton loam, 2 to 8 percent slopes--1 percent  
 Inclusion 3: Orovada loam, 2 to 8 percent slopes--1 percent

**Map Unit Setting**

*Landscape position:* Intermontane basins  
 Kleckner--Landform: Fan remnants; geomorphic position: backslope  
 Upville--Landform: Fan skirts; geomorphic position: footslope

Fulstone--Landform: Fan remnants; geomorphic position: summit; shape of slope: convex  
 Inclusion 1--Landform: Flood plains  
 Inclusion 2--Landform: Fan remnants; geomorphic position: summit; position on slope: lower; shape of slope: convex  
 Inclusion 3--Landform: Inset fans

**Major Component Description****Kleckner Series**

*Elevation:* 5,100 to 6,100 feet  
*Precipitation:* About 11 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Upville Series**

*Elevation:* 5,100 to 6,100 feet  
*Precipitation:* About 11 inches  
*Air temperature:* About 43 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Fulstone Series**

*Elevation:* 4,500 to 6,000 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Very cobbly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Dominant Present Vegetation**

Kleckner: Big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass  
 Upville: Big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass  
 Fulstone: Bluegrass, bottlebrush squirreltail, low sagebrush  
 Inclusion 1: Rush, sedge, tufted hairgrass, willow  
 Inclusion 2: Wyoming big sagebrush, bottlebrush squirreltail  
 Inclusion 3: Wyoming big sagebrush, bottlebrush squirreltail

**Ecological Site**

Kleckner: 025XY014NV  
 Upville: 025XY014NV  
 Fulstone: 025XY018NV  
 Inclusion 1: 025XY005NV  
 Inclusion 2: 025XY019NV  
 Inclusion 3: 025XY019NV



**1261--Kleckner-Heechee association****Composition****Major Components**

Kleckner gravelly loam, 4 to 15 percent slopes--55 percent

Heechee cobbly loam, 4 to 15 percent slopes--35 percent

**Contrasting Inclusions**

Inclusion 1: Donna gravelly loam, 2 to 8 percent slopes--8 percent

Inclusion 2: Uprville gravelly loam, 2 to 8 percent slopes--2 percent

**Map Unit Setting**

*Landscape position:* Fan piedmonts

Kleckner--Landform: Fan remnants; geomorphic position: backslope

Heechee--Landform: Fan remnants; geomorphic position: summit

Inclusion 1--Landform: Fan remnants; geomorphic position: backslope; shape of slope: concave

Inclusion 2--Landform: Inset fans

**Major Component Description****Kleckner Series**

*Elevation:* 5,900 to 6,500 feet

*Precipitation:* About 11 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

**Heechee Series**

*Elevation:* 5,900 to 6,500 feet

*Precipitation:* About 14 inches

*Air temperature:* About 43 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Cobbly loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

**Dominant Present Vegetation**

Kleckner: Big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Heechee: Idaho fescue, antelope bitterbrush, bluebunch wheatgrass, mountain big sagebrush

Inclusion 1: Bottlebrush squirreltail, low sagebrush

Inclusion 2: Cheatgrass

**Ecological Site**

Kleckner: 025XY014NV

Heechee: 025XY007NV

Inclusion 1: 025XY018NV

Inclusion 2: 025XY006NV

**1290--Tweba very fine sandy loam, drained, 0 to 2 percent slopes****Composition****Major Components**

Tweba very fine sandy loam, drained, 0 to 2 percent slopes--90 percent

**Contrasting Inclusions**

Inclusion 1: Orovada very fine sandy loam, 0 to 2 percent slopes--5 percent

Inclusion 2: Aeris Haplaquepts, fine-silty, mixed (calcareous), mesic loam, 0 to 4 percent slopes--5 percent

**Map Unit Setting**

*Landscape position:* Intermontane basins

Tweba--Landform: Inset fans

Inclusion 1--Landform: Inset fans

Inclusion 2--Landform: Flood plains

**Major Component Description****Tweba Series**

*Elevation:* 5,100 to 5,500 feet

*Precipitation:* About 9 inches

*Air temperature:* About 48 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Very fine sandy loam

*Drainage class:* Very poorly drained

*Dominant parent material:* Alluvium derived from mixed rocks

**Dominant Present Vegetation**

Tweba: Basin big sagebrush, basin wildrye, bluegrass

Inclusion 1: Wyoming big sagebrush, bluegrass, cheatgrass, rabbitbrush

Inclusion 2: Basin wildrye, black greasewood, cheatgrass

**Ecological Site**

Tweba: 025XY003NV

Inclusion 1: 025XY019NV

Inclusion 2: 024XY008NV

**1350--Shabliss-Hunnton-Bioya association****Composition****Major Components**

Shabliss gravelly loam, 4 to 15 percent slopes--40 percent

Hunnton gravelly loam, 15 to 30 percent slopes--35 percent

Bioya loam, 8 to 15 percent slopes--20 percent

**Contrasting Inclusions**

Inclusion 1: Xeric Torriorthents gravelly loam, 0 to 2 percent slopes--3 percent

Inclusion 2: Clementine silt loam, 0 to 2 percent slopes--1 percent

Inclusion 3: Rock outcrop--1 percent

**Map Unit Setting***Landscape position:* Fan piedmonts*Shabliss--Landform:* Fan remnants; geomorphic position: summit*Hunnton--Landform:* Fan remnants; geomorphic position: backslope; shape of slope: concave*Bioya--Landform:* Fan remnants; geomorphic position: backslope; shape of slope: plane*Inclusion 1--Landform:* Inset fans*Inclusion 2--Landform:* Flood plains*Inclusion 3--Landform:* Fan remnants; geomorphic position: backslope**Major Component Description****Shabliss Series***Elevation:* 5,100 to 5,800 feet*Precipitation:* About 9 inches*Air temperature:* About 47 degrees*Frost-free season:* About 110 days*Surface layer texture:* Gravelly loam*Drainage class:* Well drained*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash**Hunnton Series***Elevation:* 5,100 to 5,800 feet*Precipitation:* About 9 inches*Air temperature:* About 47 degrees*Frost-free season:* About 110 days*Surface layer texture:* Gravelly loam*Drainage class:* Well drained*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash**Bioya Series***Elevation:* 5,100 to 5,800 feet*Precipitation:* About 9 inches*Air temperature:* About 47 degrees*Frost-free season:* About 110 days*Surface layer texture:* Loam*Drainage class:* Well drained*Dominant parent material:* Alluvium derived from volcanic rocks, loess and volcanic ash**Dominant Present Vegetation***Shabliss:* Wyoming big sagebrush, bluegrass, bottlebrush squirreltail*Hunnton:* Wyoming big sagebrush, bluegrass, cheatgrass*Bioya:* Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass*Inclusion 1:* Basin big sagebrush, basin wildrye, rabbitbrush*Inclusion 2:* Rush, sedge, tufted hairgrass, willow*Inclusion 3:* None**Ecological Site***Shabliss:* 025XY019NV*Hunnton:* 025XY019NV*Bioya:* 025XY019NV*Inclusion 1:* 024XY006NV*Inclusion 2:* 025XY005NV*Inclusion 3:* None**1351--Shabliss-Bartome association****Composition****Major Components***Shabliss very fine sandy loam, 0 to 2 percent slopes--70 percent**Bartome very fine sandy loam, 2 to 4 percent slopes--15 percent***Contrasting Inclusions***Inclusion 1:* Durixerollic Camborthids, fine-loamy over sandy or sandy-skeletal, mixed, mesic fine sandy loam, 0 to 2 percent slopes--6 percent*Inclusion 2:* Shalake very fine sandy loam, 0 to 2 percent slopes--4 percent*Inclusion 3:* Clurde very fine sandy loam, 0 to 2 percent slopes--3 percent*Inclusion 4:* Zevadez very fine sandy loam, 0 to 2 percent slopes--2 percent**Map Unit Setting***Landscape position:* Fan piedmonts*Shabliss--Landform:* Fan remnants; geomorphic position: summit; shape of slope: plane*Bartome--Landform:* Fan remnants; geomorphic position: backslope; shape of slope: plane*Inclusion 1--Landform:* Inset fans*Inclusion 2--Landform:* Fan remnants; geomorphic position: summit; shape of slope: concave*Inclusion 3--Landform:* Fan remnants; geomorphic position: footslope; shape of slope: plane*Inclusion 4--Landform:* Fan remnants; geomorphic position: footslope; shape of slope: plane**Major Component Description****Shabliss Series***Elevation:* 5,300 to 5,500 feet*Precipitation:* About 9 inches*Air temperature:* About 47 degrees*Frost-free season:* About 110 days*Surface layer texture:* Very fine sandy loam*Drainage class:* Well drained*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash**Bartome Series***Elevation:* 5,300 to 5,500 feet*Precipitation:* About 9 inches*Air temperature:* About 47 degrees*Frost-free season:* About 105 days*Surface layer texture:* Very fine sandy loam*Drainage class:* Well drained*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash**Dominant Present Vegetation***Shabliss:* Wyoming big sagebrush, bluegrass, bottlebrush squirreltail



Bartome: Wyoming big sagebrush, bluegrass,  
bottlebrush squirreltail, cheatgrass  
Inclusion 1: Wyoming big sagebrush, bluegrass,  
bottlebrush squirreltail, cheatgrass  
Inclusion 2: Wyoming big sagebrush, bluegrass,  
bottlebrush squirreltail, cheatgrass  
Inclusion 3: Wyoming big sagebrush, bluegrass,  
cheatgrass  
Inclusion 4: Wyoming big sagebrush, bluegrass,  
bottlebrush squirreltail, cheatgrass

### ***Ecological Site***

Shabliss: 025XY019NV  
Bartome: 025XY019NV  
Inclusion 1: 025XY019NV  
Inclusion 2: 025XY019NV  
Inclusion 3: 025XY019NV  
Inclusion 4: 025XY019NV

## **1352--Shabliss-Skull Creek-Puett association**

### ***Composition***

#### ***Major Components***

Shabliss very fine sandy loam, 4 to 15 percent slopes--  
40 percent  
Skull Creek very fine sandy loam, 2 to 8 percent  
slopes--30 percent  
Puett very cobbly sandy loam, 30 to 50 percent slopes--  
20 percent

#### ***Contrasting Inclusions***

Inclusion 1: Rock outcrop--5 percent  
Inclusion 2: Durixerollic Camborthids, coarse-silty,  
mixed, mesic fine sandy loam--2 percent  
Inclusion 3: Xeric Torripsamments, mixed, mesic fine  
sand, 0 to 2 percent slopes--3 percent

### ***Map Unit Setting***

*Landscape position:* Fan piedmonts  
Shabliss--Landform: Fan remnants; geomorphic  
position: backslope; shape of slope: plane  
Skull Creek--Landform: Fan remnants; geomorphic  
position: summit  
Puett--Landform: Pediments; geomorphic position:  
backslope; aspect: south  
Inclusion 1--Landform: Pediments; geomorphic  
position: backslope; aspect: south  
Inclusion 2--Landform: Inset fans  
Inclusion 3--Landform: Fan remnants; geomorphic  
position: backslope; shape of slope: concave

### ***Major Component Description***

#### ***Shabliss Series***

*Elevation:* 4,500 to 6,000 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Very fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed  
rocks, loess and volcanic ash

#### ***Skull Creek Series***

*Elevation:* 4,500 to 6,000 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Very fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed  
rocks, loess and volcanic ash

#### ***Puett Series***

*Elevation:* 4,500 to 6,000 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 48 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Very cobbly sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium  
derived from tuffaceous rocks

### ***Dominant Present Vegetation***

Shabliss: Wyoming big sagebrush, bluegrass,  
bottlebrush squirreltail  
Skull Creek: Wyoming big sagebrush, bluegrass,  
bottlebrush squirreltail, cheatgrass  
Puett: Wyoming big sagebrush, bluegrass, rabbitbrush  
Inclusion 1: None  
Inclusion 2: Basin big sagebrush, basin wildrye,  
rabbitbrush  
Inclusion 3: Indian ricegrass, basin big sagebrush,  
needleandthread

### ***Ecological Site***

Shabliss: 025XY019NV  
Skull Creek: 025XY019NV  
Puett: 025XY025NV  
Inclusion 1: None  
Inclusion 2: 024XY006NV  
Inclusion 3: 024XY001NV

## **1360--Orovada very fine sandy loam, 0 to 2 percent slopes**

### ***Composition***

#### ***Major Components***

Orovada very fine sandy loam, 2 to 8 percent slopes--  
90 percent

#### ***Contrasting Inclusions***

Inclusion 1: Xeric Torriorthents gravelly loam, 0 to 2  
percent slopes--5 percent  
Inclusion 2: Enko fine sandy loam, 0 to 2 percent  
slopes--5 percent

### ***Map Unit Setting***

*Landscape position:* Intermontane basins  
Orovada--Landform: Fan skirts  
Inclusion 1--Landform: Fan skirts  
Inclusion 2--Landform: Fan skirts

**Major Component Description****Orovada Series***Elevation:* 4,400 to 5,000 feet*Precipitation:* About 9 inches*Air temperature:* About 47 degrees*Frost-free season:* About 110 days*Surface layer texture:* Very fine sandy loam*Drainage class:* Well drained*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash**Dominant Present Vegetation**

Orovada: Thurber needlegrass, Wyoming big sagebrush, cheatgrass, rabbitbrush

Inclusion 1: Thurber needlegrass, Wyoming big sagebrush

Inclusion 2: Thurber needlegrass, Wyoming big sagebrush

**Ecological Site**

Orovada: 024XY020NV

Inclusion 1: 024XY005NV

Inclusion 2: 024XY005NV

**1362--Orovada-Clurde-Wieland association****Composition****Major Components**

Orovada very fine sandy loam, 2 to 8 percent slopes--35 percent

Clurde very fine sandy loam, 2 to 8 percent slopes--30 percent

Wieland loam, 8 to 15 percent slopes--20 percent

**Contrasting Inclusions**

Inclusion 1: Bioya loam, 2 to 8 percent slopes--5 percent

Inclusion 2: Typic Durorthids, fine-loamy, mixed, mesic loam, 2 to 8 percent slopes--4 percent

Inclusion 3: Xeric Torriorthents, loamy-skeletal, mixed, nonacid, mesic gravelly loam, 0 to 2 percent slopes--3 percent

Inclusion 4: Duric Camborthids, coarse-loamy, mixed, mesic fine sandy loam, 0 to 2 percent slopes--3 percent

**Map Unit Setting***Landscape position:* Intermontane basins

Orovada--Landform: Fan skirts

Clurde--Landform: Fan remnants; geomorphic position: summit; shape of slope: plane

Wieland--Landform: Fan remnants; geomorphic position: summit; position on slope: upper part

Inclusion 1--Landform: Fan remnants; geomorphic position: summit; shape of slope: convex

Inclusion 2--Landform: Fan remnants; geomorphic position: summit; position on slope: lower; shape of slope: convex

Inclusion 3--Landform: Inset fans

Inclusion 4--Landform: Fan skirts

**Major Component Description****Orovada Series***Elevation:* 5,000 to 5,200 feet*Precipitation:* About 9 inches*Air temperature:* About 47 degrees*Frost-free season:* About 110 days*Surface layer texture:* Very fine sandy loam*Drainage class:* Well drained*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash**Clurde Series***Elevation:* 5,200 to 5,400 feet*Precipitation:* About 9 inches*Air temperature:* About 47 degrees*Frost-free season:* About 110 days*Surface layer texture:* Very fine sandy loam*Drainage class:* Well drained*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash**Wieland Series***Elevation:* 5,300 to 5,500 feet*Precipitation:* About 9 inches*Air temperature:* About 47 degrees*Frost-free season:* About 110 days*Surface layer texture:* Loam*Drainage class:* Well drained*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash**Dominant Present Vegetation**

Orovada: Thurber needlegrass, Wyoming big sagebrush, cheatgrass, rabbitbrush

Clurde: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Wieland: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Inclusion 1: Wyoming big sagebrush, bottlebrush squirreltail

Inclusion 2: Bottlebrush squirreltail, bud sagebrush, cheatgrass, shadscale

Inclusion 3: Basin big sagebrush, basin wildrye, rabbitbrush

Inclusion 4: Basin wildrye, black greasewood, cheatgrass, rabbitbrush

**Ecological Site**

Orovada: 024XY020NV

Clurde: 024XY005NV

Wieland: 024XY005NV

Inclusion 1: 024XY005NV

Inclusion 2: 024XY002NV

Inclusion 3: 024XY006NV

Inclusion 4: 024XY002NV



**1363--Orovada-Tweba-Weso association****Composition****Major Components**

Orovada very fine sandy loam, 0 to 2 percent slopes--40 percent

Tweba sandy loam, drained, 0 to 2 percent slopes, rarely flooded--25 percent

Weso very fine sandy loam, 0 to 2 percent slopes--25 percent

**Contrasting Inclusions**

Inclusion 1: Enko fine sandy loam, 0 to 4 percent slopes--5 percent

Inclusion 2: Tweba sandy loam, drained, 0 to 2 percent slopes, frequently flooded--5 percent

**Map Unit Setting**

*Landscape position:* Intermontane basins

Orovada--Landform: Fan skirts; position on slope: upper part

Tweba--Landform: Inset fans

Weso--Landform: Fan skirts; position on slope: lower part

Inclusion 1--Landform: Fan skirts; geomorphic position: summit; position on slope: lower part

Inclusion 2--Landform: Inset fans

**Major Component Description****Orovada Series**

*Elevation:* 4,400 to 5,000 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Very fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

**Tweba Series**

*Elevation:* 4,400 to 5,200 feet

*Precipitation:* About 9 inches

*Air temperature:* About 48 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Sandy loam

*Drainage class:* Very poorly drained

*Dominant parent material:* Alluvium derived from mixed rocks

**Weso Series**

*Elevation:* 4,400 to 5,000 feet

*Precipitation:* About 7 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Very fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

**Dominant Present Vegetation**

Orovada: Thurber needlegrass, Wyoming big sagebrush, cheatgrass, rabbitbrush

Tweba: Basin wildrye, black greasewood

Weso: Big sagebrush, bottlebrush squirreltail, shadscale

Inclusion 1: Wyoming big sagebrush, bottlebrush squirreltail, cheatgrass

Inclusion 2: Basin big sagebrush, basin wildrye, bluegrass

**Ecological Site**

Orovada: 024XY020NV

Tweba: 024XY006NV

Weso: 024XY002NV

Inclusion 1: 024XY005NV

Inclusion 2: 025XY003NV

**1530--Creemon-Placeritos association****Composition****Major Components**

Creemon silt loam, 0 to 2 percent slopes--45 percent

Placeritos silt loam, 0 to 2 percent slopes--40 percent

**Contrasting Inclusions**

Inclusion 1: Clurde very fine sandy loam, 0 to 2 percent slopes--6 percent

Inclusion 2: Orovada very fine sandy loam, 0 to 2 percent slopes--6 percent

Inclusion 3: Durorthidic Torriorthents, coarse-silty, mixed, mesic silt loam, 0 to 2 percent slopes--3 percent

**Map Unit Setting**

*Landscape position:* Intermontane basins

Creemon--Landform: Stream terraces

Placeritos--Landform: Flood plains

Inclusion 1--Landform: Fan skirts

Inclusion 2--Landform: Fan skirts

Inclusion 3--Landform: Flood plains

**Major Component Description****Creemon Series**

*Elevation:* 4,400 to 4,800 feet

*Precipitation:* About 7 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Silt loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

**Placeritos Series**

*Elevation:* 4,400 to 4,800 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Silt loam

*Drainage class:* Somewhat poorly drained

*Dominant parent material:* Alluvium derived from mixed rocks

***Dominant Present Vegetation***

Creemon: Black greasewood, bottlebrush squirreltail, shadscale

Placeritos: Black greasewood, cheatgrass

Inclusion 1: Wyoming big sagebrush, bottlebrush squirreltail, cheatgrass

Inclusion 2: Wyoming big sagebrush, cheatgrass, rabbitbrush

Inclusion 3: Basin wildrye, black greasewood, inland saltgrass

***Ecological Site***

Creemon: 024XY003NV

Placeritos: 024XY022NV

Inclusion 1: 024XY005NV

Inclusion 2: 024XY020NV

Inclusion 3: 024XY011NV

**1572--Weso-Orovada-Shabliss association*****Composition******Major Components***

Weso very fine sandy loam, 0 to 2 percent slopes--45 percent

Orovada very fine sandy loam, 2 to 8 percent slopes--25 percent

Shabliss very fine sandy loam, 15 to 30 percent slopes--20 percent

***Contrasting Inclusions***

Inclusion 1: Xeric Torripsamments fine sand, 8 to 15 percent slopes--10 percent

***Map Unit Setting***

*Landscape position:* Intermontane basins

Weso--Landform: Fan skirts

Orovada--Landform: Inset fans

Shabliss--Landform: Fan remnants; geomorphic position: backslope

Inclusion 1--Landform: Fan remnants; geomorphic position: backslope

***Major Component Description******Weso Series***

*Elevation:* 4,400 to 4,800 feet

*Precipitation:* About 7 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Very fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

***Orovada Series***

*Elevation:* 4,400 to 5,000 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Very fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

***Shabliss Series***

*Elevation:* 4,600 to 5,000 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Very fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

***Dominant Present Vegetation***

Weso: Big sagebrush, bottlebrush squirreltail, shadscale

Orovada: Thurber needlegrass, Wyoming big sagebrush, cheatgrass, rabbitbrush

Shabliss: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail

Inclusion 1: Indian ricegrass, basin big sagebrush, cheatgrass, rabbitbrush

***Ecological Site***

Weso: 024XY002NV

Orovada: 024XY020NV

Shabliss: 024XY005NV

Inclusion 1: 024XY001NV

**1573--Weso-Orovada-Tweba associaiton*****Composition******Major Components***

Weso very fine sandy loam, 2 to 8 percent slopes--30 percent

Orovada loam, 2 to 8 percent slopes--30 percent

Tweba sandy loam, drained, 0 to 2 percent slopes, rarely flooded--25 percent

***Contrasting Inclusions***

Inclusion 1: Typic Torriorthents, loamy-skeletal, mixed, nonacid, mesic sandy loam, 2 to 8 percent slopes--10 percent

Inclusion 2: Tweba sandy loam, drained, 0 to 2 percent slopes, frequently flooded--3 percent

Inclusion 3: Shabliss loam, 8 to 15 percent slopes--1 percent

Inclusion 4: Wieland loam, 8 to 15 percent slopes--1 percent

***Map Unit Setting***

*Landscape position:* Intermontane basins

Weso--Landform: Fan skirts; position on slope: lower part

Orovada--Landform: Fan skirts; position on slope: upper part

Tweba--Landform: Inset fans

Inclusion 1--Landform: Inset fans

Inclusion 2--Landform: Inset fans

Inclusion 3--Landform: Fan remnants; geomorphic position: backslope; shape of slope: convex



Inclusion 4--Landform: Fan remnants; geomorphic position: backslope; shape of slope: concave

### ***Major Component Description***

#### **Weso Series**

*Elevation:* 4,400 to 5,200 feet

*Precipitation:* About 7 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Very fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

#### **Orovada Series**

*Elevation:* 4,400 to 5,200 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

#### **Tweba Series**

*Elevation:* 4,400 to 5,200 feet

*Precipitation:* About 9 inches

*Air temperature:* About 48 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Sandy loam

*Drainage class:* Very poorly drained

*Dominant parent material:* Alluvium derived from mixed rocks

### ***Dominant Present Vegetation***

Weso: Bottlebrush squirreltail, shadscale

Orovada: Wyoming big sagebrush, bluebunch wheatgrass, bottlebrush squirreltail

Tweba: Basin big sagebrush, basin wildrye, black greasewood, rubber rabbitbrush

Inclusion 1: Basin wildrye, black greasewood

Inclusion 2: Basin big sagebrush, basin wildrye, bluegrass

Inclusion 3: Wyoming big sagebrush, bottlebrush squirreltail, cheatgrass

Inclusion 4: Wyoming big sagebrush, bottlebrush squirreltail, cheatgrass

### ***Ecological Site***

Weso: 024XY002NV

Orovada: 025XY019NV

Tweba: 024XY006NV

Inclusion 1: 024XY011NV

Inclusion 2: 025XY003NV

Inclusion 3: 025XY019NV

Inclusion 4: 025XY019NV

## **1617--Cleavage-Hapgood-Tweener association**

### ***Composition***

#### ***Major Components***

Cleavage extremely gravelly loam, 30 to 75 percent slopes--40 percent

Hapgood very gravelly loam, 30 to 50 percent slopes--30 percent

Tweener very cobbly sandy loam, 30 to 50 percent slopes--15 percent

#### ***Contrasting Inclusions***

Inclusion 1: Welch sandy loam, drained, 0 to 2 percent slopes, rarely flooded--6 percent

Inclusion 2: Cleavage extremely gravelly loam, 4 to 15 percent slopes--3 percent

Inclusion 3: Cleavage very gravelly loam, 15 to 30 percent slopes--3 percent

Inclusion 4: Loncan very gravelly loam, 30 to 50 percent slopes--3 percent

### ***Map Unit Setting***

*Landscape position:* Mountains

Cleavage--Landform: Mountains; geomorphic position: backslope; shape of slope: convex

Hapgood--Landform: Mountains; geomorphic position: backslope; shape of slope: concave; aspect: north

Tweener--Landform: Mountains; geomorphic position: backslope; shape of slope: plane

Inclusion 1--Landform: Drainageways

Inclusion 2--Landform: Mountains; geomorphic position: summit

Inclusion 3--Landform: Mountains; geomorphic position: backslope

Inclusion 4--Landform: Mountains; geomorphic position: backslope; shape of slope: convex; aspect: north

### ***Major Component Description***

#### **Cleavage Series**

*Elevation:* 6,600 to 7,400 feet

*Precipitation:* About 14 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Extremely gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from tuffaceous rocks

#### **Hapgood Series**

*Elevation:* 6,600 to 7,400 feet

*Precipitation:* About 18 inches

*Air temperature:* About 42 degrees

*Frost-free season:* About 60 days

*Surface layer texture:* Very gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium and colluvium derived from volcanic rocks

#### **Tweener Series**

*Elevation:* 6,600 to 7,400 feet

*Precipitation:* About 14 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Very cobbly sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from tuffaceous rocks

#### ***Dominant Present Vegetation***

Cleavage: Idaho fescue, bluegrass, bottlebrush squirreltail, low sagebrush  
 Hapgood: Mountain brome, snowberry  
 Tweener: Antelope bitterbrush, bluegrass, cheatgrass, mountain big sagebrush  
 Inclusion 1: Basin big sagebrush, basin wildrye, bluegrass  
 Inclusion 2: Bluegrass, bottlebrush squirreltail, low sagebrush  
 Inclusion 3: Bluegrass, bottlebrush squirreltail, low sagebrush  
 Inclusion 4: Idaho fescue, antelope bitterbrush, mountain big sagebrush

#### ***Ecological Site***

Cleavage: 025XY024NV  
 Hapgood: 025XY004NV  
 Tweener: 025XY007NV  
 Inclusion 1: 025XY003NV  
 Inclusion 2: 025XY024NV  
 Inclusion 3: 025XY017NV  
 Inclusion 4: 025XY012NV

### **1618--Cleavage-Sumine-Pequop association**

#### ***Composition***

##### ***Major Components***

Cleavage very gravelly loam, 15 to 50 percent slopes--40 percent  
 Sumine very gravelly loam, 15 to 50 percent slopes--25 percent  
 Pequop gravelly loam, 15 to 50 percent slopes--20 percent

##### ***Contrasting Inclusions***

Inclusion 1: Tweener very cobbly sandy loam, 15 to 50 percent slopes--8 percent  
 Inclusion 2: Aridic Argixerolls, fine-loamy, mixed, frigid gravelly loam, 4 to 15 percent slopes--3 percent  
 Inclusion 3: Galey very cobbly loam, 15 to 50 percent slopes--2 percent  
 Inclusion 4: Welch silt loam, 0 to 2 percent slopes, occasionally flooded--2 percent

#### ***Map Unit Setting***

*Landscape position:* Hills  
 Cleavage--Landform: Hills; geomorphic position: backslope; shape of slope: convex  
 Sumine--Landform: Hills; geomorphic position: backslope; aspect: south  
 Pequop--Landform: Hills; geomorphic position: backslope; shape of slope: concave; aspect: north

Inclusion 1--Landform: Hills; geomorphic position: backslope; shape of slope: convex; aspect: north  
 Inclusion 2--Landform: Hills; geomorphic position: backslope; shape of slope: concave  
 Inclusion 3--Landform: Hills; geomorphic position: backslope; shape of slope: convex; aspect: north  
 Inclusion 4--Landform: Drainageways

#### ***Major Component Description***

##### ***Cleavage Series***

*Elevation:* 6,200 to 6,600 feet  
*Precipitation:* About 14 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Very gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum derived from tuffaceous rocks

##### ***Sumine Series***

*Elevation:* 6,200 to 6,600 feet  
*Precipitation:* About 12 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Very gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from tuffaceous rocks

##### ***Pequop Series***

*Elevation:* 6,200 to 6,600 feet  
*Precipitation:* About 14 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from tuffaceous rocks

#### ***Dominant Present Vegetation***

Cleavage: Idaho fescue, bluegrass, bottlebrush squirreltail, low sagebrush  
 Sumine: Antelope bitterbrush, bluebunch wheatgrass, cheatgrass, mountain big sagebrush  
 Pequop: Idaho fescue, bluegrass, mountain big sagebrush  
 Inclusion 1: Antelope bitterbrush, bluegrass, mountain big sagebrush  
 Inclusion 2: Idaho fescue, basin big sagebrush  
 Inclusion 3: Idaho fescue, bluegrass, mountain big sagebrush  
 Inclusion 4: Nevada bluegrass, alpine timothy

#### ***Ecological Site***

Cleavage: 025XY017NV  
 Sumine: 025XY009NV  
 Pequop: 025XY012NV  
 Inclusion 1: 025XY007NV  
 Inclusion 2: 025XY027NV  
 Inclusion 3: 025XY012NV  
 Inclusion 4: 025XY006NV



**1619--Cleavage-Tusk-Sumine association****Composition****Major Components**

Cleavage extremely gravelly loam, 15 to 50 percent slopes--35 percent  
 Tusk loam, 30 to 50 percent slopes--30 percent  
 Sumine very gravelly loam, 30 to 50 percent slopes--20 percent

**Contrasting Inclusions**

Inclusion 1: Chen very gravelly loam, 15 to 50 percent slopes--10 percent  
 Inclusion 2: Cotant very gravelly loam, 8 to 15 percent slopes--3 percent  
 Inclusion 3: Hackwood silt loam, 30 to 50 percent slopes--1 percent  
 Inclusion 4: Rock outcrop--1 percent

**Map Unit Setting**

**Landscape position:** Mountains

**Cleavage--Landform:** Mountains; geomorphic position: summit; position on slope: upper; shape of slope: convex

**Tusk--Landform:** Mountains; geomorphic position: backslope; shape of slope: concave; aspect: north

**Sumine--Landform:** Mountains; geomorphic position: backslope; aspect: south

**Inclusion 1--Landform:** Mountains; geomorphic position: backslope; position on slope: lower; shape of slope: convex

**Inclusion 2--Landform:** Hills; geomorphic position: footslope

**Inclusion 3--Landform:** Mountains; geomorphic position: backslope; position on slope: lower; shape of slope: plane; aspect: north

**Inclusion 4--Landform:** Mountains; geomorphic position: backslope

**Major Component Description****Cleavage Series**

**Elevation:** 6,800 to 7,600 feet

**Precipitation:** About 14 inches

**Air temperature:** About 44 degrees

**Frost-free season:** About 85 days

**Surface layer texture:** Extremely gravelly loam

**Drainage class:** Well drained

**Dominant parent material:** Residuum derived from tuffaceous rocks

**Tusk Series**

**Elevation:** 6,600 to 7,600 feet

**Precipitation:** About 14 inches

**Air temperature:** About 44 degrees

**Frost-free season:** About 85 days

**Surface layer texture:** Loam

**Drainage class:** Well drained

**Dominant parent material:** Colluvium derived from tuffaceous rocks

**Sumine Series**

**Elevation:** 6,600 to 7,600 feet

**Precipitation:** About 12 inches

**Air temperature:** About 44 degrees

**Frost-free season:** About 85 days

**Surface layer texture:** Very gravelly loam

**Drainage class:** Well drained

**Dominant parent material:** Residuum and colluvium derived from tuffaceous rocks

**Dominant Present Vegetation**

**Cleavage:** Idaho fescue, bluegrass, bottlebrush squirreltail, low sagebrush

**Tusk:** Idaho fescue, basin wildrye, mountain big sagebrush

**Sumine:** Antelope bitterbrush, bluebunch wheatgrass, cheatgrass, mountain big sagebrush

**Inclusion 1:** Bluegrass, bottlebrush squirreltail, low sagebrush

**Inclusion 2:** Bluegrass, bottlebrush squirreltail, low sagebrush

**Inclusion 3:** Mountain brome, quaking aspen, slender wheatgrass

**Inclusion 4:** None

**Ecological Site**

**Cleavage:** 025XY024NV

**Tusk:** 025XY029NV

**Sumine:** 025XY009NV

**Inclusion 1:** 025XY017NV

**Inclusion 2:** 025XY017NV

**Inclusion 3:** 025XY065NV

**Inclusion 4:** None

**1621--Cleavage-Graley-Cleavage, moderately steep association****Composition****Major Components**

Cleavage very gravelly loam, 4 to 15 percent slopes--35 percent

Graley stony loam, 4 to 15 percent slopes--30 percent

Cleavage extremely gravelly loam, 15 to 30 percent slopes--20 percent

**Contrasting Inclusions**

**Inclusion 1:** Pachic Argixerolls, fine-loamy, mixed, frigid very gravelly loam, 30 to 50 percent slopes--6 percent

**Inclusion 2:** Rock outcrop--4 percent

**Inclusion 3:** Welch silt loam, 0 to 2 percent slopes, frequently flooded--3 percent

**Inclusion 4:** Sumine very gravelly loam, 30 to 50 percent slopes--2 percent

**Map Unit Setting**

**Landscape position:** Mountains

**Cleavage--Landform:** Mountains; geomorphic position: summit; position on slope: upper part

**Graley--Landform:** Mountains; geomorphic position: backslope; shape of slope: concave; aspect: north

**Cleavage--Landform:** Mountains; geomorphic position: backslope; shape of slope: convex

Inclusion 1--Landform: Mountains; geomorphic position: backslope; position on slope: upper; shape of slope: plane; aspect: north

Inclusion 2--Landform: Mountains; geomorphic position: backslope

Inclusion 3--Landform: Drainageways

Inclusion 4--Landform: Mountains; geomorphic position: backslope

### ***Major Component Description***

#### **Cleavage Series**

*Elevation:* 6,500 to 7,500 feet

*Precipitation:* About 14 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Very gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from volcanic rocks

#### **Graley Series**

*Elevation:* 6,000 to 7,500 feet

*Precipitation:* About 14 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Stony loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from quartzite

#### **Cleavage Series**

*Elevation:* 6,000 to 7,500 feet

*Precipitation:* About 14 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Extremely gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from volcanic rocks

### ***Dominant Present Vegetation***

Cleavage: Idaho fescue, low sagebrush

Graley: Idaho fescue, antelope bitterbrush, bluebunch wheatgrass, mountain big sagebrush

Cleavage: Idaho fescue, bluegrass, bottlebrush squirreltail, low sagebrush

Inclusion 1: Idaho fescue, mountain big sagebrush

Inclusion 2: None

Inclusion 3: Rush, sedge, tufted hairgrass, willow

Inclusion 4: Big sagebrush, bluebunch wheatgrass

### ***Ecological Site***

Cleavage: 025XY017NV

Graley: 025XY012NV

Cleavage: 025XY024NV

Inclusion 1: 025XY010NV

Inclusion 2: None

Inclusion 3: 025XY005NV

Inclusion 4: 025XY009NV

## **1622--Cleavage-Sumine-Hapgood association**

### ***Composition***

#### ***Major Components***

Cleavage extremely gravelly loam, 50 to 75 percent slopes--50 percent

Sumine very gravelly loam, 30 to 50 percent slopes--20 percent

Hapgood very gravelly loam, 50 to 75 percent slopes--15 percent

#### ***Contrasting Inclusions***

Inclusion 1: Cleavage extremely gravelly loam, 15 to 50 percent slopes--5 percent

Inclusion 2: Hapgood very gravelly loam, 15 to 30 percent slopes--5 percent

Inclusion 3: Tusel gravelly loam, 50 to 75 percent slopes--3 percent

Inclusion 4: Argic Pachic Cryoborolls gravelly loam, 50 to 75 percent slopes--2 percent

### ***Map Unit Setting***

*Landscape position:* Mountains

Cleavage--Landform: Mountains; geomorphic position: backslope; shape of slope: convex

Sumine--Landform: Mountains; geomorphic position: backslope; aspect: south

Hapgood--Landform: Mountains; geomorphic position: backslope; shape of slope: concave; aspect: north

Inclusion 1--Landform: Mountains; geomorphic position: summit

Inclusion 2--Landform: Mountains; geomorphic position: footslope; aspect: north

Inclusion 3--Landform: Mountains; geomorphic position: backslope; position on slope: upper; shape of slope: plane; aspect: north

Inclusion 4--Landform: Mountains; geomorphic position: backslope; shape of slope: concave; aspect: north

### ***Major Component Description***

#### **Cleavage Series**

*Elevation:* 6,200 to 7,600 feet

*Precipitation:* About 14 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Extremely gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from tuffaceous rocks

#### **Sumine Series**

*Elevation:* 6,200 to 7,600 feet

*Precipitation:* About 12 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Very gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from tuffaceous rocks



**Hapgood Series***Elevation:* 6,200 to 7,600 feet*Precipitation:* About 18 inches*Air temperature:* About 42 degrees*Frost-free season:* About 60 days*Surface layer texture:* Very gravelly loam*Drainage class:* Well drained*Dominant parent material:* Alluvium and colluvium derived from tuffaceous rocks**Dominant Present Vegetation**

Cleavage: Idaho fescue, bluegrass, bottlebrush squirreltail, low sagebrush

Sumine: Antelope bitterbrush, bluebunch wheatgrass, cheatgrass, mountain big sagebrush

Hapgood: Mountain brome, snowberry

Inclusion 1: Bluegrass, bottlebrush squirreltail, low sagebrush

Inclusion 2: Mountain brome, snowberry

Inclusion 3: Idaho fescue, mountain big sagebrush

Inclusion 4: Basin wildrye, mountain big sagebrush

**Ecological Site**

Cleavage: 025XY024NV

Sumine: 025XY009NV

Hapgood: 025XY004NV

Inclusion 1: 025XY024NV

Inclusion 2: 025XY004NV

Inclusion 3: 025XY010NV

Inclusion 4: 025XY029NV

**1623--Cleavage-Hapgood-Sumine association****Composition****Major Components**

Cleavage extremely gravelly loam, 15 to 50 percent slopes--50 percent

Hapgood very gravelly loam, 30 to 50 percent slopes--20 percent

Sumine very gravelly loam, 30 to 50 percent slopes--20 percent

**Contrasting Inclusions**

Inclusion 1: Typic Argixerolls, loamy-skeletal, mixed, frigid very gravelly loam, 15 to 50 percent slopes--3 percent

Inclusion 2: Cleavage very gravelly loam, 15 to 50 percent slopes--3 percent

Inclusion 3: Welch silt loam, drained, 2 to 4 percent slopes, rarely flooded--2 percent

Inclusion 4: Aridic Argixerolls, fine-loamy, mixed, frigid gravelly loam, 4 to 15 percent slopes--2 percent

**Map Unit Setting***Landscape position:* Mountains

Cleavage--Landform: Mountains; geomorphic position: backslope; shape of slope: convex

Hapgood--Landform: Mountains; geomorphic position: backslope; shape of slope: concave; aspect: north

Sumine--Landform: Mountains; geomorphic position: backslope; aspect: south

Inclusion 1--Landform: Mountains; geomorphic position: backslope; position on slope: lower; shape of slope: convex; aspect: north

Inclusion 2--Landform: Mountains; geomorphic position: backslope; position on slope: lower; shape of slope: convex

Inclusion 3--Landform: Drainageways

Inclusion 4--Landform: Mountains; geomorphic position: footslope

**Major Component Description****Cleavage Series***Elevation:* 6,200 to 7,200 feet*Precipitation:* About 14 inches*Air temperature:* About 44 degrees*Frost-free season:* About 85 days*Surface layer texture:* Extremely gravelly loam*Drainage class:* Well drained*Dominant parent material:* Residuum derived from tuffaceous rocks**Hapgood Series***Elevation:* 6,200 to 7,200 feet*Precipitation:* About 18 inches*Air temperature:* About 42 degrees*Frost-free season:* About 60 days*Surface layer texture:* Very gravelly loam*Drainage class:* Well drained*Dominant parent material:* Alluvium and colluvium derived from tuffaceous rocks**Sumine Series***Elevation:* 6,200 to 7,200 feet*Precipitation:* About 12 inches*Air temperature:* About 44 degrees*Frost-free season:* About 85 days*Surface layer texture:* Very gravelly loam*Drainage class:* Well drained*Dominant parent material:* Residuum and colluvium derived from tuffaceous rocks**Dominant Present Vegetation**

Cleavage: Idaho fescue, bluegrass, bottlebrush squirreltail, low sagebrush

Hapgood: Mountain brome, snowberry

Sumine: Antelope bitterbrush, bluebunch wheatgrass, cheatgrass, mountain big sagebrush

Inclusion 1: Idaho fescue, antelope bitterbrush, mountain big sagebrush

Inclusion 2: Bluegrass, bottlebrush squirreltail, low sagebrush

Inclusion 3: Basin big sagebrush, basin wildrye, bluegrass

Inclusion 4: Idaho fescue, basin big sagebrush

**Ecological Site**

Cleavage: 025XY024NV

Hapgood: 025XY004NV

Sumine: 025XY009NV

Inclusion 1: 025XY012NV

Inclusion 2: 025XY017NV

Inclusion 3: 025XY003NV  
Inclusion 4: 025XY027NV

## 1625--Cleavage-Ninemile-Sumine association

### *Composition*

#### **Major Components**

Cleavage very gravelly loam, 15 to 50 percent slopes--55 percent  
Ninemile gravelly loam, 4 to 15 percent slopes--15 percent  
Sumine very gravelly loam, 15 to 50 percent slopes--15 percent

#### **Contrasting Inclusions**

Inclusion 1: Welch sandy loam, 0 to 2 percent slopes, occasionally flooded--5 percent  
Inclusion 2: Typic Argixerolls, loamy-skeletal, mixed, frigid very gravelly loam--5 percent  
Inclusion 3: Typic Argixerolls, fine, montmorillonitic, frigid very gravelly loam--3 percent  
Inclusion 4: Tusk loam, 30 to 50 percent slopes--2 percent

### *Map Unit Setting*

*Landscape position:* Mountains and foothills  
*Cleavage--Landform:* Mountains; geomorphic position: summit; position on slope: upper; shape of slope: convex  
*Ninemile--Landform:* Mountains; geomorphic position: footslope; position on slope: lower part  
*Sumine--Landform:* Mountains; geomorphic position: backslope; aspect: south  
*Inclusion 1--Landform:* Drainageways  
*Inclusion 2--Landform:* Mountains; geomorphic position: backslope; shape of slope: convex; aspect: north  
*Inclusion 3--Landform:* Mountains; geomorphic position: footslope  
*Inclusion 4--Landform:* Mountains; geomorphic position: backslope; shape of slope: concave; aspect: north

### *Major Component Description*

#### **Cleavage Series**

*Elevation:* 6,300 to 6,700 feet  
*Precipitation:* About 14 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Very gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum derived from mixed rocks

#### **Ninemile Series**

*Elevation:* 6,000 to 6,400 feet  
*Precipitation:* About 14 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Gravelly loam  
*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from volcanic rocks

#### **Sumine Series**

*Elevation:* 6,000 to 6,700 feet  
*Precipitation:* About 12 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Very gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from mixed rocks

### *Dominant Present Vegetation*

*Cleavage:* Idaho fescue, bluegrass, bottlebrush squirreltail, low sagebrush  
*Ninemile:* Bluegrass, bottlebrush squirreltail, low sagebrush  
*Sumine:* Antelope bitterbrush, cheatgrass, mountain big sagebrush  
*Inclusion 1:* Nevada bluegrass, alpine timothy  
*Inclusion 2:* Idaho fescue, antelope bitterbrush, mountain big sagebrush  
*Inclusion 3:* Idaho fescue, basin big sagebrush  
*Inclusion 4:* Basin wildrye, mountain big sagebrush

### *Ecological Site*

*Cleavage:* 025XY017NV  
*Ninemile:* 025XY017NV  
*Sumine:* 025XY009NV  
*Inclusion 1:* 025XY006NV  
*Inclusion 2:* 025XY012NV  
*Inclusion 3:* 025XY027NV  
*Inclusion 4:* 025XY029NV

## 1626--Cleavage-Carstump-Chen association

### *Composition*

#### **Major Components**

Cleavage very gravelly loam, 4 to 8 percent slopes--35 percent  
Carstump gravelly loam, 4 to 8 percent slopes--30 percent  
Chen very cobbly loam, 4 to 15 percent slopes--20 percent

#### **Contrasting Inclusions**

Inclusion 1: Rock outcrop--10 percent  
Inclusion 2: Galey very cobbly loam, 4 to 15 percent slopes--5 percent

### *Map Unit Setting*

*Landscape position:* Hills  
*Cleavage--Landform:* Hills; geomorphic position: backslope; shape of slope: plane  
*Carstump--Landform:* Hills; geomorphic position: backslope; shape of slope: plane  
*Chen--Landform:* Hills; geomorphic position: summit  
*Inclusion 1--Landform:* Hills; geomorphic position: backslope



Inclusion 2--Landform: Hills; geomorphic position: shoulder; aspect: north

### ***Major Component Description***

#### **Cleavage Series**

*Elevation:* 5,600 to 7,000 feet

*Precipitation:* About 14 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Very gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from volcanic rocks

#### **Carstump Series**

*Elevation:* 5,600 to 7,000 feet

*Precipitation:* About 11 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from volcanic rocks

#### **Chen Series**

*Elevation:* 5,600 to 7,000 feet

*Precipitation:* About 12 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Very cobbly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

### ***Dominant Present Vegetation***

Cleavage: Idaho fescue, bluegrass, bottlebrush squirreltail, low sagebrush

Carstump: Big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Chen: Bluegrass, bottlebrush squirreltail, low sagebrush

Inclusion 1: None

Inclusion 2: Antelope bitterbrush, big sagebrush, bluebunch wheatgrass

### ***Ecological Site***

Cleavage: 025XY017NV

Carstump: 025XY014NV

Chen: 025XY017NV

Inclusion 1: None

Inclusion 2: 025XY012NV

## **1628--Cleavage-Chen-Reluctan association**

### ***Composition***

#### ***Major Components***

Cleavage very gravelly loam, 15 to 30 percent slopes--40 percent

Chen very cobbly loam, 4 to 15 percent slopes--30 percent

Reluctan gravelly loam, 15 to 30 percent slopes--15 percent

### ***Contrasting Inclusions***

Inclusion 1: Carstump gravelly loam, 4 to 15 percent slopes--5 percent

Inclusion 2: Aridic Argixerolls, loamy-skeletal, mixed, frigid gravelly loam, 15 to 30 percent slopes--4 percent

Inclusion 3: Clementine silt loam, drained, 0 to 2 percent slopes--3 percent

Inclusion 4: Rock outcrop--3 percent

### ***Map Unit Setting***

*Landscape position:* Mountains

Cleavage--Landform: Mountains; geomorphic position: shoulder

Chen--Landform: Mountains; geomorphic position: summit

Reluctan--Landform: Mountains; geomorphic position: backslope; shape of slope: concave; aspect: north

Inclusion 1--Landform: Mountains; geomorphic position: footslope

Inclusion 2--Landform: Mountains; geomorphic position: backslope; shape of slope: convex

Inclusion 3--Landform: Drainageways

Inclusion 4--Landform: Mountains; geomorphic position: backslope; position on slope: upper part

### ***Major Component Description***

#### **Cleavage Series**

*Elevation:* 5,600 to 7,100 feet

*Precipitation:* About 14 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Very gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from volcanic rocks

#### **Chen Series**

*Elevation:* 5,800 to 7,100 feet

*Precipitation:* About 12 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Very cobbly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

#### **Reluctan Series**

*Elevation:* 5,400 to 7,000 feet

*Precipitation:* About 12 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Gravelly loam

*Drainage class:* Well drained

### ***Dominant Present Vegetation***

Cleavage: Idaho fescue, bluegrass, bottlebrush squirreltail, low sagebrush

Chen: Bluegrass, low sagebrush

Reluctan: Bluegrass, mountain big sagebrush  
 Inclusion 1: Big sagebrush, bottlebrush squirreltail, cheatgrass  
 Inclusion 2: Big sagebrush, bottlebrush squirreltail, cheatgrass  
 Inclusion 3: Basin big sagebrush, basin wildrye, bluegrass  
 Inclusion 4: None

#### ***Ecological Site***

Cleavage: 025XY017NV  
 Chen: 025XY017NV  
 Reluctan: 025XY012NV  
 Inclusion 1: 025XY014NV  
 Inclusion 2: 025XY014NV  
 Inclusion 3: 025XY003NV  
 Inclusion 4: None

### **1640--Tusk-Cleavage-Hackwood association**

#### ***Composition***

##### ***Major Components***

Tusk gravelly loam, 8 to 15 percent slopes--40 percent  
 Cleavage very cobbly loam, 4 to 15 percent slopes--30 percent  
 Hackwood silt loam, 4 to 15 percent slopes--15 percent

##### ***Contrasting Inclusions***

Inclusion 1: Rock outcrop--6 percent  
 Inclusion 2: Sumine very gravelly loam, 15 to 30 percent slopes--3 percent  
 Inclusion 3: Welch silt loam, 0 to 2 percent slopes, frequently flooded--3 percent  
 Inclusion 4: Reluctan gravelly loam, 15 to 30 percent slopes--3 percent

#### ***Map Unit Setting***

*Landscape position:* Mountains  
 Tusk--Landform: Mountains; geomorphic position: backslope; position on slope: lower; shape of slope: concave  
 Cleavage--Landform: Mountains; geomorphic position: summit; position on slope: upper part  
 Hackwood--Landform: Mountains; geomorphic position: backslope; shape of slope: concave  
 Inclusion 1--Landform: Mountains; geomorphic position: backslope; position on slope: upper; shape of slope: convex  
 Inclusion 2--Landform: Mountains; geomorphic position: backslope; aspect: south  
 Inclusion 3--Landform: Drainageways  
 Inclusion 4--Landform: Mountains; geomorphic position: backslope; position on slope: lower; shape of slope: convex

#### ***Major Component Description***

##### ***Tusk Series***

*Elevation:* 6,500 to 8,300 feet  
*Precipitation:* About 14 inches  
*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days  
*Surface layer texture:* Gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Colluvium derived from volcanic rocks

##### ***Cleavage Series***

*Elevation:* 6,700 to 8,500 feet  
*Precipitation:* About 14 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Very cobbly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum derived from volcanic rocks

##### ***Hackwood Series***

*Elevation:* 6,500 to 8,500 feet  
*Precipitation:* About 18 inches  
*Air temperature:* About 42 degrees  
*Frost-free season:* About 60 days  
*Surface layer texture:* Silt loam  
*Drainage class:* Well drained  
*Dominant parent material:* Colluvium derived from volcanic rocks

#### ***Dominant Present Vegetation***

Tusk: Cheatgrass, mountain big sagebrush, rabbitbrush, snowberry  
 Cleavage: Idaho fescue, bluegrass, bottlebrush squirreltail, low sagebrush  
 Hackwood: Mountain brome, quaking aspen, slender wheatgrass  
 Inclusion 1: None  
 Inclusion 2: Big sagebrush, bluebunch wheatgrass, cheatgrass  
 Inclusion 3: Rush, sedge, tufted hairgrass, willow  
 Inclusion 4: Idaho fescue, antelope bitterbrush, mountain big sagebrush

#### ***Ecological Site***

Tusk: 025XY004NV  
 Cleavage: 025XY024NV  
 Hackwood: 025XY065NV  
 Inclusion 1: None  
 Inclusion 2: 025XY009NV  
 Inclusion 3: 025XY005NV  
 Inclusion 4: 025XY012NV

### **1650--Ninemile-Tusk-Ninemile, steep association**

#### ***Composition***

##### ***Major Components***

Ninemile very cobbly loam, 4 to 15 percent slopes--35 percent  
 Tusk gravelly loam, 15 to 50 percent slopes--30 percent  
 Ninemile very cobbly loam, 30 to 50 percent slopes--20 percent



**Contrasting Inclusions**

Inclusion 1: Pachic Argixerolls, loamy-skeletal, mixed, frigid very gravelly loam, 30 to 50 percent slopes--5 percent

Inclusion 2: Rock outcrop--5 percent

Inclusion 3: Graley gravelly loam, 15 to 30 percent slopes--3 percent

Inclusion 4: Pachic Haploxerolls, fine-loamy, mixed, frigid very gravelly loam, 0 to 4 percent slopes--2 percent

**Map Unit Setting**

*Landscape position:* Mountains

Ninemile--Landform: Mountains; geomorphic position: summit

Tusk--Landform: Mountains; geomorphic position: backslope; shape of slope: concave; aspect: north

Ninemile--Landform: Mountains; geomorphic position: backslope; shape of slope: convex

Inclusion 1--Landform: Mountains; geomorphic position: backslope; position on slope: upper; shape of slope: plane; aspect: north

Inclusion 2--Landform: Mountains; geomorphic position: backslope; position on slope: upper; shape of slope: convex

Inclusion 3--Landform: Mountains; geomorphic position: backslope; position on slope: lower; shape of slope: convex; aspect: north

Inclusion 4--Landform: Drainageways

**Major Component Description****Ninemile Series**

*Elevation:* 7,500 to 8,300 feet

*Precipitation:* About 14 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Very cobbly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from volcanic rocks

**Tusk Series**

*Elevation:* 7,000 to 8,300 feet

*Precipitation:* About 14 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Colluvium derived from volcanic rocks

**Ninemile Series**

*Elevation:* 7,000 to 8,300 feet

*Precipitation:* About 14 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Very cobbly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from volcanic rocks

**Dominant Present Vegetation**

Ninemile: Bluegrass, bottlebrush squirreltail, low sagebrush

Tusk: Cheatgrass, mountain big sagebrush, rabbitbrush, snowberry

Ninemile: Bluegrass, bottlebrush squirreltail, low sagebrush

Inclusion 1: Idaho fescue, bottlebrush squirreltail, mountain big sagebrush

Inclusion 2: None

Inclusion 3: Antelope bitterbrush, bluegrass, mountain big sagebrush

Inclusion 4: Nevada bluegrass, alpine timothy

**Ecological Site**

Ninemile: 025XY017NV

Tusk: 025XY004NV

Ninemile: 025XY017NV

Inclusion 1: 025XY010NV

Inclusion 2: None

Inclusion 3: 025XY012NV

Inclusion 4: 025XY006NV

**1651--Ninemile-Reluctan-Ninemile, moderately steep association****Composition****Major Components**

Ninemile very cobbly loam, 4 to 15 percent slopes--35 percent

Reluctan cobbly loam, 15 to 50 percent slopes--35 percent

Ninemile very cobbly loam, 15 to 30 percent slopes--15 percent

**Contrasting Inclusions**

Inclusion 1: Rock outcrop--6 percent

Inclusion 2: Welch silt loam, 0 to 2 percent slopes, occasionally flooded--3 percent

Inclusion 3: Pachic Argixerolls, loamy-skeletal, mixed, frigid cobbly loam, 30 to 50 percent slopes--3 percent

Inclusion 4: Aridic Argixerolls, fine-loamy, mixed, frigid gravelly loam--3 percent

**Map Unit Setting**

*Landscape position:* Mountains

Ninemile--Landform: Mountains; geomorphic position: summit; position on slope: upper part

Reluctan--Landform: Mountains; geomorphic position: backslope; position on slope: lower; aspect: north

Ninemile--Landform: Mountains; geomorphic position: backslope; shape of slope: convex

Inclusion 1--Landform: Mountains; geomorphic position: backslope; position on slope: upper; shape of slope: convex

Inclusion 2--Landform: Drainageways

Inclusion 3--Landform: Mountains; geomorphic position: backslope; position on slope: upper; aspect: north

Inclusion 4--Landform: Mountains; geomorphic position: backslope; aspect: south

### ***Major Component Description***

#### **Ninemile Series**

*Elevation:* 6,300 to 7,000 feet

*Precipitation:* About 14 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Very cobbly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from volcanic rocks

#### **Reluctan Series**

*Elevation:* 6,000 to 7,000 feet

*Precipitation:* About 12 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Cobbly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

#### **Ninemile Series**

*Elevation:* 6,000 to 7,000 feet

*Precipitation:* About 14 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Very cobbly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from volcanic rocks

### ***Dominant Present Vegetation***

Ninemile: Bluegrass, bottlebrush squirreltail, low sagebrush

Reluctan: Bluegrass, mountain big sagebrush, rabbitbrush

Ninemile: Bluegrass, bottlebrush squirreltail, low sagebrush

Inclusion 1: None

Inclusion 2: Nevada bluegrass, alpine timothy

Inclusion 3: Idaho fescue, mountain big sagebrush

Inclusion 4: Big sagebrush, bluebunch wheatgrass, cheatgrass

### ***Ecological Site***

Ninemile: 025XY017NV

Reluctan: 025XY012NV

Ninemile: 025XY017NV

Inclusion 1: None

Inclusion 2: 025XY006NV

Inclusion 3: 025XY010NV

Inclusion 4: 025XY009NV

## **1652--Ninemile, steep-Graley-Ninemile association**

### ***Composition***

#### ***Major Components***

Ninemile very cobbly loam, 30 to 50 percent slopes--35 percent

Graley very cobbly loam, 30 to 50 percent slopes--30 percent

Ninemile very cobbly loam, 4 to 15 percent slopes--20 percent

#### ***Contrasting Inclusions***

Inclusion 1: Rock outcrop--9 percent

Inclusion 2: Welch silt loam, 0 to 2 percent slopes, frequently flooded--2 percent

Inclusion 3: Shively loam, 30 to 50 percent slopes--2 percent

Inclusion 4: Sumine very gravelly loam, 30 to 50 percent slopes--2 percent

### ***Map Unit Setting***

*Landscape position:* Mountains

Ninemile--Landform: Mountains; geomorphic position: backslope; shape of slope: convex

Graley--Landform: Mountains; geomorphic position: backslope; position on slope: lower; shape of slope: concave; aspect: north

Ninemile--Landform: Mountains; geomorphic position: summit

Inclusion 1--Landform: Hills; geomorphic position: summit

Inclusion 2--Landform: Drainageways

Inclusion 3--Landform: Mountains; geomorphic position: backslope; position on slope: upper; shape of slope: concave; aspect: north

Inclusion 4--Landform: Mountains; geomorphic position: backslope; aspect: south

### ***Major Component Description***

#### **Ninemile Series**

*Elevation:* 6,000 to 7,000 feet

*Precipitation:* About 14 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Very cobbly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from volcanic rocks

#### **Graley Series**

*Elevation:* 6,000 to 7,000 feet

*Precipitation:* About 14 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Very cobbly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from quartzite

#### **Ninemile Series**

*Elevation:* 6,400 to 7,000 feet



*Precipitation:* About 14 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Very cobbly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum derived from volcanic rocks

#### ***Dominant Present Vegetation***

Ninemile: Bluegrass, bottlebrush squirreltail, low sagebrush  
 Graley: Idaho fescue, antelope bitterbrush, bluebunch wheatgrass, mountain big sagebrush  
 Ninemile: Bluegrass, bottlebrush squirreltail, low sagebrush  
 Inclusion 1: None  
 Inclusion 2: Rush, sedge, tufted hairgrass, willow  
 Inclusion 3: Idaho fescue, mountain big sagebrush  
 Inclusion 4: Big sagebrush, bluebunch wheatgrass, cheatgrass

#### ***Ecological Site***

Ninemile: 025XY017NV  
 Graley: 025XY012NV  
 Ninemile: 025XY017NV  
 Inclusion 1: None  
 Inclusion 2: 025XY005NV  
 Inclusion 3: 025XY010NV  
 Inclusion 4: 025XY009NV

### **1653--Ninemile-Reluctan-Graley association**

#### ***Composition***

##### ***Major Components***

Ninemile cobbly loam, 4 to 15 percent slopes--40 percent  
 Reluctan very gravelly loam, 4 to 15 percent slopes--30 percent  
 Graley stony loam, 15 to 30 percent slopes--20 percent

##### ***Contrasting Inclusions***

Inclusion 1: Rock outcrop--6 percent  
 Inclusion 2: Welch silt loam, 0 to 2 percent slopes, frequently flooded--2 percent  
 Inclusion 3: Welch silt loam, 0 to 2 percent slopes, occasionally flooded--2 percent

#### ***Map Unit Setting***

*Landscape position:* Mountains  
 Ninemile--Landform: Mountains; geomorphic position: summit  
 Reluctan--Landform: Mountains; geomorphic position: backslope; position on slope: lower part  
 Graley--Landform: Mountains; geomorphic position: backslope; position on slope: upper part  
 Inclusion 1--Landform: Mountains; geomorphic position: summit  
 Inclusion 2--Landform: Drainageways  
 Inclusion 3--Landform: Drainageways

#### ***Major Component Description***

##### ***Ninemile Series***

*Elevation:* 6,400 to 7,000 feet  
*Precipitation:* About 14 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Cobbly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum derived from volcanic rocks

##### ***Reluctan Series***

*Elevation:* 6,000 to 6,500 feet  
*Precipitation:* About 12 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Very gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

##### ***Graley Series***

*Elevation:* 6,200 to 7,000 feet  
*Precipitation:* About 14 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Stony loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum derived from quartzite

#### ***Dominant Present Vegetation***

Ninemile: Bluegrass, bottlebrush squirreltail, low sagebrush  
 Reluctan: Bluegrass, bottlebrush squirreltail, mountain big sagebrush, rabbitbrush  
 Graley: Idaho fescue, antelope bitterbrush, bluebunch wheatgrass, mountain big sagebrush  
 Inclusion 1: None  
 Inclusion 2: Rush, sedge, tufted hairgrass, willow  
 Inclusion 3: Nevada bluegrass, alpine timothy

#### ***Ecological Site***

Ninemile: 025XY017NV  
 Reluctan: 025XY012NV  
 Graley: 025XY012NV  
 Inclusion 1: None  
 Inclusion 2: 025XY005NV  
 Inclusion 3: 025XY006NV

### **1655--Ninemile-Thwoop-Pequop association**

#### ***Composition***

##### ***Major Components***

Ninemile very stony loam, 15 to 30 percent slopes--35 percent  
 Thwoop gravelly silt loam, 8 to 15 percent slopes--30 percent  
 Pequop gravelly loam, 15 to 50 percent slopes--20 percent

**Contrasting Inclusions**

- Inclusion 1: Quarz very gravelly loam, 4 to 15 percent slopes--5 percent  
 Inclusion 2: Aridic Argixerolls, loamy-skeletal, mixed, frigid gravelly loam, 30 to 50 percent slopes--5 percent  
 Inclusion 3: Rock outcrop--4 percent  
 Inclusion 4: Lithic Argixerolls, loamy-skeletal, mixed, frigid very gravelly loam, 15 to 50 percent slopes--1 percent

**Map Unit Setting**

- Landscape position:* Mountains  
 Ninemile--Landform: Mountains; geomorphic position: summit; position on slope: upper part  
 Thwoop--Landform: Mountains; geomorphic position: footslope; position on slope: lower part  
 Pequop--Landform: Mountains; geomorphic position: backslope; aspect: north  
 Inclusion 1--Landform: Mountains; geomorphic position: backslope; aspect: south  
 Inclusion 2--Landform: Mountains; geomorphic position: backslope; shape of slope: concave  
 Inclusion 3--Landform: Hills; geomorphic position: summit  
 Inclusion 4--Landform: Mountains; geomorphic position: shoulder

**Major Component Description****Ninemile Series**

- Elevation:* 5,900 to 6,300 feet  
*Precipitation:* About 14 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Very stony loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

**Thwoop Series**

- Elevation:* 5,700 to 6,000 feet  
*Precipitation:* About 11 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Gravelly silt loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum derived from volcanic rocks

**Pequop Series**

- Elevation:* 5,700 to 6,300 feet  
*Precipitation:* About 14 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

**Dominant Present Vegetation**

- Ninemile: Bluegrass, bottlebrush squirreltail, low sagebrush  
 Thwoop: Thurber needlegrass, basin wildrye, big sagebrush, bluegrass  
 Pequop: Idaho fescue, bluegrass, mountain big sagebrush  
 Inclusion 1: Big sagebrush, bluebunch wheatgrass, bottlebrush squirreltail  
 Inclusion 2: Big sagebrush, bluebunch wheatgrass, bottlebrush squirreltail  
 Inclusion 3: None  
 Inclusion 4: Idaho fescue

**Ecological Site**

- Ninemile: 025XY017NV  
 Thwoop: 025XY014NV  
 Pequop: 025XY012NV  
 Inclusion 1: 025XY014NV  
 Inclusion 2: 025XY014NV  
 Inclusion 3: None  
 Inclusion 4: 025XY046NV

**1656--Ninemile-Pequop-Gumble association****Composition****Major Components**

- Ninemile gravelly loam, 4 to 15 percent slopes--35 percent  
 Pequop gravelly loam, 15 to 30 percent slopes--35 percent  
 Gumble very gravelly sandy loam, 15 to 30 percent slopes--20 percent

**Contrasting Inclusions**

- Inclusion 1: Reluctan gravelly loam, 15 to 30 percent slopes--6 percent  
 Inclusion 2: Pie Creek gravelly loam, 2 to 15 percent slopes--2 percent  
 Inclusion 3: Welch sandy loam, drained, 0 to 2 percent slopes, rarely flooded--2 percent

**Map Unit Setting**

- Landscape position:* Hills  
 Ninemile--Landform: Hills; geomorphic position: summit  
 Pequop--Landform: Hills; geomorphic position: backslope; position on slope: upper; aspect: north  
 Gumble--Landform: Hills; geomorphic position: backslope; aspect: south  
 Inclusion 1--Landform: Hills; geomorphic position: backslope; position on slope: lower; aspect: north  
 Inclusion 2--Landform: Hills; geomorphic position: footslope  
 Inclusion 3--Landform: Drainageways

**Major Component Description****Ninemile Series**

- Elevation:* 5,900 to 6,400 feet  
*Precipitation:* About 14 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days



*Surface layer texture:* Gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum derived from tuffaceous rocks

#### **Pequop Series**

*Elevation:* 5,800 to 6,400 feet  
*Precipitation:* About 14 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

#### **Gumble Series**

*Elevation:* 5,500 to 6,400 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Very gravelly sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum derived from tuffaceous rocks

#### ***Dominant Present Vegetation***

Ninemile: Bluegrass, bottlebrush squirreltail, low sagebrush  
 Pequop: Idaho fescue, bluegrass, mountain big sagebrush  
 Gumble: Wyoming big sagebrush, bluebunch wheatgrass  
 Inclusion 1: Idaho fescue, antelope bitterbrush, mountain big sagebrush  
 Inclusion 2: Bluegrass, bottlebrush squirreltail, low sagebrush  
 Inclusion 3: Basin big sagebrush, basin wildrye, bluegrass

#### ***Ecological Site***

Ninemile: 025XY017NV  
 Pequop: 025XY012NV  
 Gumble: 025XY015NV  
 Inclusion 1: 025XY012NV  
 Inclusion 2: 025XY018NV  
 Inclusion 3: 025XY003NV

### **1657--Ninemile-Alyan association**

#### ***Composition***

##### ***Major Components***

Ninemile gravelly loam, 4 to 15 percent slopes--45 percent  
 Alyan gravelly loam, 8 to 15 percent slopes--40 percent

##### ***Contrasting Inclusions***

Inclusion 1: Xerollic Haplargids, fine, montmorillonitic, frigid gravelly loam, 4 to 15 percent slopes--9 percent

Inclusion 2: Linkup very gravelly loam, 4 to 15 percent slopes--3 percent  
 Inclusion 3: Welch silt loam, drained, 2 to 4 percent slopes, rarely flooded--2 percent  
 Inclusion 4: Welch silt loam, 0 to 2 percent slopes, occasionally flooded--1 percent

#### ***Map Unit Setting***

*Landscape position:* Hills  
 Ninemile--Landform: Hills; geomorphic position: summit  
 Alyan--Landform: Hills; geomorphic position: summit  
 Inclusion 1--Landform: Hills; geomorphic position: summit; shape of slope: convex  
 Inclusion 2--Landform: Hills; geomorphic position: backslope  
 Inclusion 3--Landform: Drainageways  
 Inclusion 4--Landform: Drainageways

#### ***Major Component Description***

##### ***Ninemile Series***

*Elevation:* 5,500 to 6,000 feet  
*Precipitation:* About 12 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum derived from volcanic rocks

##### ***Alyan Series***

*Elevation:* 5,500 to 6,000 feet  
*Precipitation:* About 12 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from tuffaceous rocks

#### ***Dominant Present Vegetation***

Ninemile: Big sagebrush, bluegrass, bottlebrush squirreltail  
 Alyan: Bluegrass, mountain big sagebrush  
 Inclusion 1: Wyoming big sagebrush, bottlebrush squirreltail, cheatgrass  
 Inclusion 2: Bluegrass, bottlebrush squirreltail, low sagebrush  
 Inclusion 3: Basin big sagebrush, basin wildrye, bluegrass  
 Inclusion 4: Nevada bluegrass, alpine timothy

#### ***Ecological Site***

Ninemile: 025XY017NV  
 Alyan: 025XY014NV  
 Inclusion 1: 025XY019NV  
 Inclusion 2: 025XY018NV  
 Inclusion 3: 025XY003NV  
 Inclusion 4: 025XY006NV

**1658--Ninemile-Vanwyper-Ninemile,  
moderately steep association****Composition****Major Components**

Ninemile gravelly loam, 4 to 15 percent slopes--35 percent  
 Vanwyper very cobbly loam, 15 to 30 percent slopes--25 percent  
 Ninemile gravelly loam, 15 to 30 percent slopes--25 percent

**Contrasting Inclusions**

Inclusion 1: Aridic Argixerolls, loamy-skeletal, mixed, frigid gravelly loam, 15 to 30 percent slopes--10 percent  
 Inclusion 2: Rock outcrop--3 percent  
 Inclusion 3: Rubble land fragmental material--2 percent

**Map Unit Setting**

*Landscape position:* Hills

Ninemile--Landform: Hills; geomorphic position: summit

Vanwyper--Landform: Hills; geomorphic position: backslope; aspect: south

Ninemile--Landform: Hills; geomorphic position: backslope

Inclusion 1--Landform: Hills; geomorphic position: backslope; aspect: north

Inclusion 2--Landform: Hills; geomorphic position: summit

Inclusion 3--Landform: Hills; geomorphic position: backslope

**Major Component Description****Ninemile Series**

*Elevation:* 5,300 to 6,700 feet

*Precipitation:* About 14 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from volcanic rocks

**Vanwyper Series**

*Elevation:* 5,300 to 6,700 feet

*Precipitation:* About 10 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Very cobbly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

**Ninemile Series**

*Elevation:* 5,300 to 6,700 feet

*Precipitation:* About 14 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from volcanic rocks

**Dominant Present Vegetation**

Ninemile: Bluegrass, bottlebrush squirreltail, low sagebrush

Vanwyper: Big sagebrush, bluebunch wheatgrass, cheatgrass

Ninemile: Bluegrass, bottlebrush squirreltail, low sagebrush

Inclusion 1: Big sagebrush, bottlebrush squirreltail, cheatgrass

Inclusion 2: None

Inclusion 3: None

**Ecological Site**

Ninemile: 025XY017NV

Vanwyper: 025XY015NV

Ninemile: 025XY017NV

Inclusion 1: 025XY014NV

Inclusion 2: None

Inclusion 3: None

**1659--Ninemile-Carstump association****Composition****Major Components**

Ninemile gravelly loam, 8 to 15 percent slopes--50 percent

Carstump gravelly loam, 8 to 30 percent slopes--35 percent

**Contrasting Inclusions**

Inclusion 1: Susie Creek loam, 4 to 15 percent slopes--10 percent

Inclusion 2: Soughe very cobbly loam, 30 to 50 percent slopes--3 percent

Inclusion 3: Rubble land fragmental material--1 percent

Inclusion 4: Rock outcrop--1 percent

**Map Unit Setting**

*Landscape position:* Hills

Ninemile--Landform: Hills; geomorphic position: summit

Carstump--Landform: Hills; geomorphic position: backslope

Inclusion 1--Landform: Hills; geomorphic position: footslope

Inclusion 2--Landform: Hills; geomorphic position: backslope; aspect: south

Inclusion 3--Landform: Hills; geomorphic position: backslope

Inclusion 4--Landform: Hills; geomorphic position: summit

**Major Component Description****Ninemile Series**

*Elevation:* 6,000 to 6,400 feet

*Precipitation:* About 14 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Gravelly loam



*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from volcanic rocks

#### **Carstump Series**

*Elevation:* 5,400 to 6,300 feet

*Precipitation:* About 11 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from volcanic rocks

#### ***Dominant Present Vegetation***

Ninemile: Bluegrass, bottlebrush squirreltail, low sagebrush

Carstump: Big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Inclusion 1: Basin big sagebrush, rabbitbrush

Inclusion 2: Big sagebrush, bluebunch wheatgrass, cheatgrass

Inclusion 3: None

Inclusion 4: None

#### ***Ecological Site***

Ninemile: 025XY017NV

Carstump: 025XY014NV

Inclusion 1: 025XY014NV

Inclusion 2: 025XY015NV

Inclusion 3: None

Inclusion 4: None

### **1660--Susie Creek-Pie Creek-Pattani association**

#### ***Composition***

##### ***Major Components***

Susie Creek loam, 4 to 15 percent slopes--55 percent

Pie Creek loam, 15 to 30 percent slopes--25 percent

Pattani clay, 4 to 15 percent slopes--15 percent

##### ***Contrasting Inclusions***

Inclusion 1: Reluctant gravelly loam, 15 to 30 percent slopes--3 percent

Inclusion 2: Xerollic Haplargids, clayey-skeletal, montmorillonitic, frigid gravelly loam, 30 to 50 percent slopes--2 percent

#### ***Map Unit Setting***

*Landscape position:* Hills

Susie Creek--Landform: Hills; geomorphic position: summit; shape of slope: plane

Pie Creek--Landform: Hills; geomorphic position: backslope; shape of slope: plane

Pattani--Landform: Hills; geomorphic position: summit

Inclusion 1--Landform: Hills; geomorphic position: backslope; shape of slope: concave; aspect: north

Inclusion 2--Landform: Hills; geomorphic position: backslope; aspect: south

#### ***Major Component Description***

##### **Susie Creek Series**

*Elevation:* 5,500 to 6,000 feet

*Precipitation:* About 11 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 90 days

*Surface layer texture:* Loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from tuffaceous rocks

##### **Pie Creek Series**

*Elevation:* 5,500 to 6,000 feet

*Precipitation:* About 11 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from tuffaceous rocks

##### **Pattani Series**

*Elevation:* 5,500 to 6,000 feet

*Precipitation:* About 11 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Clay

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from tuffaceous rocks

#### ***Dominant Present Vegetation***

Susie Creek: Basin big sagebrush, bluebunch wheatgrass, bluegrass, rabbitbrush

Pie Creek: Bluegrass, bottlebrush squirreltail, low sagebrush

Pattani: Basin wildrye, big sagebrush, rabbitbrush

Inclusion 1: Idaho fescue, antelope bitterbrush, mountain big sagebrush

Inclusion 2: Big sagebrush, bluebunch wheatgrass, cheatgrass

#### ***Ecological Site***

Susie Creek: 025XY014NV

Pie Creek: 025XY018NV

Pattani: 025XY013NV

Inclusion 1: 025XY012NV

Inclusion 2: 025XY015NV

### **1671--Linkup-Carstump-Linkup, very cobbly loam association**

#### ***Composition***

##### ***Major Components***

Linkup cobbly loam, 15 to 30 percent slopes--45 percent

Carstump very gravelly loam, 15 to 30 percent slopes--20 percent

Linkup very cobbly loam, 4 to 15 percent slopes--20 percent

**Contrasting Inclusions**

- Inclusion 1: Welch silt loam, drained, 2 to 4 percent slopes, rarely flooded--6 percent  
 Inclusion 2: Rock outcrop--5 percent  
 Inclusion 3: Welch silt loam, 0 to 2 percent slopes, frequently flooded--2 percent  
 Inclusion 4: Welch silt loam, 0 to 2 percent slopes, occasionally flooded--2 percent

**Map Unit Setting**

*Landscape position:* Hills

Linkup--Landform: Hills; geomorphic position: backslope; shape of slope: convex

Carstump--Landform: Hills; geomorphic position: backslope; shape of slope: concave

Linkup--Landform: Hills; geomorphic position: summit

Inclusion 1--Landform: Drainageways

Inclusion 2--Landform: Hills; geomorphic position: summit

Inclusion 3--Landform: Drainageways

Inclusion 4--Landform: Drainageways

**Major Component Description****Linkup Series**

*Elevation:* 5,900 to 7,500 feet

*Precipitation:* About 11 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Cobbly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

**Carstump Series**

*Elevation:* 5,900 to 7,500 feet

*Precipitation:* About 11 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Very gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from volcanic rocks

**Linkup Series**

*Elevation:* 6,100 to 7,500 feet

*Precipitation:* About 11 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Very cobbly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

**Dominant Present Vegetation**

Linkup: Bluegrass, bottlebrush squirreltail

Carstump: Bluegrass, bottlebrush squirreltail, cheatgrass

Linkup: Bluegrass, bottlebrush squirreltail

Inclusion 1: Basin wildrye, bluegrass

Inclusion 2: None

Inclusion 3: Rush, tufted hairgrass, willow

Inclusion 4: Alpine timothy

**Ecological Site**

Linkup: 025XY018NV

Carstump: 025XY014NV

Linkup: 025XY018NV

Inclusion 1: 025XY003NV

Inclusion 2: None

Inclusion 3: 025XY005NV

Inclusion 4: 025XY006NV

**1672--Linkup, steep-Carstump-Linkup association****Composition****Major Components**

Linkup very cobbly loam, 30 to 50 percent slopes--40 percent

Carstump gravelly loam, 30 to 50 percent slopes--25 percent

Linkup very cobbly loam, 4 to 15 percent slopes--25 percent

**Contrasting Inclusions**

Inclusion 1: Rock outcrop--3 percent

Inclusion 2: Welch silt loam, 0 to 2 percent slopes, frequently flooded--3 percent

Inclusion 3: Reluctan gravelly loam, 8 to 15 percent slopes--2 percent

Inclusion 4: Welch silt loam, drained, 2 to 4 percent slopes, rarely flooded--2 percent

**Map Unit Setting**

*Landscape position:* Mountains

Linkup--Landform: Mountains; geomorphic position: backslope; shape of slope: convex

Carstump--Landform: Mountains; geomorphic position: backslope; position on slope: upper; shape of slope: plane

Linkup--Landform: Mountains; geomorphic position: summit

Inclusion 1--Landform: Mountains; geomorphic position: summit

Inclusion 2--Landform: Drainageways

Inclusion 3--Landform: Mountains; geomorphic position: backslope; position on slope: lower; shape of slope: concave; aspect: north

Inclusion 4--Landform: Drainageways

**Major Component Description****Linkup Series**

*Elevation:* 6,000 to 8,000 feet

*Precipitation:* About 11 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Very cobbly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from volcanic rocks



**Carstump Series***Elevation:* 6,000 to 7,500 feet*Precipitation:* About 11 inches*Air temperature:* About 44 degrees*Frost-free season:* About 85 days*Surface layer texture:* Gravelly loam*Drainage class:* Well drained*Dominant parent material:* Residuum derived from volcanic rocks**Linkup Series***Elevation:* 6,500 to 8,000 feet*Precipitation:* About 11 inches*Air temperature:* About 44 degrees*Frost-free season:* About 85 days*Surface layer texture:* Very cobbly loam*Drainage class:* Well drained*Dominant parent material:* Residuum and colluvium derived from volcanic rocks***Dominant Present Vegetation***

Linkup: Bluegrass, bottlebrush squirreltail

Carstump: Bluegrass, bottlebrush squirreltail, cheatgrass

Linkup: Bluegrass, bottlebrush squirreltail

Inclusion 1: None

Inclusion 2: Rush, tufted hairgrass, willow

Inclusion 3: Idaho fescue, antelope bitterbrush

Inclusion 4: Basin wildrye, bluegrass

***Ecological Site***

Linkup: 025XY018NV

Carstump: 025XY014NV

Linkup: 025XY018NV

Inclusion 1: None

Inclusion 2: 025XY005NV

Inclusion 3: 025XY012NV

Inclusion 4: 025XY003NV

**1673--Linkup-Quarz-Alyan association*****Composition******Major Components***

Linkup very gravelly loam, 2 to 8 percent slopes--35 percent

Quarz very gravelly loam, 30 to 50 percent slopes--35 percent

Alyan cobbly loam, 15 to 50 percent slopes--20 percent

***Contrasting Inclusions***

Inclusion 1: Reluctan very gravelly loam, 15 to 30 percent slopes--5 percent

Inclusion 2: Rock outcrop--3 percent

Inclusion 3: Welch silt loam, drained, 2 to 4 percent slopes, rarely flooded--2 percent

***Map Unit Setting****Landscape position:* Plateaus

Linkup--Landform: Plateaus; geomorphic position: summit

Quarz--Landform: Plateaus; geomorphic position: backslope; aspect: south

Alyan--Landform: Plateaus; geomorphic position: backslope; position on slope: upper; aspect: north

Inclusion 1--Landform: Plateaus; geomorphic position: backslope; position on slope: lower; aspect: north

Inclusion 2--Landform: Plateaus; geomorphic position: backslope

Inclusion 3--Landform: Drainageways

***Major Component Description*****Linkup Series***Elevation:* 5,500 to 6,000 feet*Precipitation:* About 11 inches*Air temperature:* About 44 degrees*Frost-free season:* About 85 days*Surface layer texture:* Very gravelly loam*Drainage class:* Well drained*Dominant parent material:* Residuum and colluvium derived from volcanic rocks**Quarz Series***Elevation:* 5,000 to 6,000 feet*Precipitation:* About 12 inches*Air temperature:* About 44 degrees*Frost-free season:* About 85 days*Surface layer texture:* Very gravelly loam*Drainage class:* Well drained*Dominant parent material:* Residuum and colluvium derived from tuffaceous rocks**Alyan Series***Elevation:* 5,300 to 6,000 feet*Precipitation:* About 12 inches*Air temperature:* About 44 degrees*Frost-free season:* About 85 days*Surface layer texture:* Cobbly loam*Drainage class:* Well drained*Dominant parent material:* Residuum and colluvium derived from tuffaceous rocks***Dominant Present Vegetation***

Linkup: Bluegrass, bottlebrush squirreltail

Quarz: Antelope bitterbrush, basin wildrye, bluebunch wheatgrass

Alyan: Idaho fescue, bluegrass, cheatgrass

Inclusion 1: Idaho fescue, antelope bitterbrush, mountain big sagebrush

Inclusion 2: None

Inclusion 3: Basin wildrye, bluegrass

***Ecological Site***

Linkup: 025XY018NV

Quarz: 025XY009NV

Alyan: 025XY012NV

Inclusion 1: 025XY012NV

Inclusion 2: None

Inclusion 3: 025XY003NV

**1675--Linkup-Snowmore-Ratsow association****Composition****Major Components**

Linkup gravelly clay loam, 4 to 15 percent slopes--45 percent  
 Snowmore very fine sandy loam, 2 to 4 percent slopes--20 percent  
 Ratsow loam, 0 to 2 percent slopes--20 percent  
**Contrasting Inclusions**  
 Inclusion 1: Olac cobbly loam, 4 to 15 percent slopes--5 percent  
 Inclusion 2: Coltroop very fine sandy loam, 0 to 2 percent slopes--4 percent  
 Inclusion 3: Rock outcrop--3 percent  
 Inclusion 4: Rubble land fragmental material--3 percent

**Map Unit Setting**

*Landscape position:* Hills

Linkup--Landform: Hills; geomorphic position: backslope; shape of slope: concave

Snowmore--Landform: Hills; geomorphic position: shoulder

Ratsow--Landform: Hills; geomorphic position: summit; shape of slope: plane

Inclusion 1--Landform: Hills; geomorphic position: footslope

Inclusion 2--Landform: Hills; geomorphic position: summit; shape of slope: convex

Inclusion 3--Landform: Hills; geomorphic position: summit

Inclusion 4--Landform: Hills; geomorphic position: backslope

**Major Component Description****Linkup Series**

*Elevation:* 5,100 to 6,000 feet

*Precipitation:* About 11 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Gravelly clay loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

**Snowmore Series**

*Elevation:* 5,100 to 6,000 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Very fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Loess and volcanic ash

**Ratsow Series**

*Elevation:* 5,100 to 6,000 feet

*Precipitation:* About 11 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from volcanic rocks

**Dominant Present Vegetation**

Linkup: Bluegrass, bottlebrush squirreltail

Snowmore: Bluegrass, bottlebrush squirreltail, cheatgrass

Ratsow: Bluegrass, bottlebrush squirreltail, cheatgrass

Inclusion 1: Bluegrass, bottlebrush squirreltail

Inclusion 2: Bluegrass, bottlebrush squirreltail, cheatgrass

Inclusion 3: None

Inclusion 4: None

**Ecological Site**

Linkup: 025XY018NV

Snowmore: 025XY019NV

Ratsow: 025XY014NV

Inclusion 1: 025XY018NV

Inclusion 2: 025XY019NV

Inclusion 3: None

Inclusion 4: None

**1676--Linkup-Quarz association****Composition****Major Components**

Linkup cobbly loam, 4 to 15 percent slopes--65 percent  
 Quarz very gravelly loam, 4 to 15 percent slopes--20 percent

**Contrasting Inclusions**

Inclusion 1: Vanwyper cobbly loam, 15 to 50 percent slopes--8 percent

Inclusion 2: Rock outcrop--5 percent

Inclusion 3: Welch silt loam, 0 to 2 percent slopes, frequently flooded--2 percent

**Map Unit Setting**

*Landscape position:* Hills

Linkup--Landform: Hills; geomorphic position: backslope; shape of slope: convex

Quarz--Landform: Hills; geomorphic position: backslope; shape of slope: plane

Inclusion 1--Landform: Hills; geomorphic position: backslope; aspect: south

Inclusion 2--Landform: Hills; geomorphic position: summit

Inclusion 3--Landform: Drainageways

**Major Component Description****Linkup Series**

*Elevation:* 6,100 to 6,400 feet

*Precipitation:* About 11 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Cobbly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from volcanic rocks



**Quarz Series***Elevation:* 6,100 to 6,000 feet*Precipitation:* About 12 inches*Air temperature:* About 44 degrees*Frost-free season:* About 85 days*Surface layer texture:* Very gravelly loam*Drainage class:* Well drained*Dominant parent material:* Residuum and colluvium derived from mixed rocks***Dominant Present Vegetation***

Linkup: Bluegrass, bottlebrush squirreltail

Quarz: Bluegrass, bottlebrush squirreltail, cheatgrass

Inclusion 1: Bluebunch wheatgrass

Inclusion 2: None

Inclusion 3: Rush, tufted hairgrass, willow

***Ecological Site***

Linkup: 025XY018NV

Quarz: 025XY014NV

Inclusion 1: 025XY015NV

Inclusion 2: None

Inclusion 3: 025XY005NV

**1680--Carstump-Reluctan-Ninemile association, hilly*****Composition******Major Components***

Carstump very gravelly loam, 15 to 30 percent slopes--30 percent

Reluctan cobbly loam, 15 to 30 percent slopes--30 percent

Ninemile very cobbly loam, 15 to 30 percent slopes--25 percent

***Contrasting Inclusions***

Inclusion 1: Rubble land fragmental material--8 percent

Inclusion 2: Pachic Argixerolls, loamy-skeletal, mixed, frigid cobbly loam, 30 to 50 percent slopes--3 percent

Inclusion 3: Lithic Xerollic Haplargids, clayey, montmorillonitic, frigid very gravelly loam, 4 to 15 percent slopes--3 percent

Inclusion 4: Welch silt loam, 0 to 2 percent slopes, frequently flooded--1 percent

***Map Unit Setting****Landscape position:* Mountains

Carstump--Landform: Mountains; geomorphic position: backslope; shape of slope: plane; aspect: south

Reluctan--Landform: Mountains; geomorphic position: backslope; position on slope: lower; aspect: north

Ninemile--Landform: Mountains; geomorphic position: backslope; shape of slope: convex

Inclusion 1--Landform: Mountains; geomorphic position: backslope

Inclusion 2--Landform: Mountains; geomorphic position: backslope; position on slope: upper; aspect: north

Inclusion 3--Landform: Mountains; geomorphic position: summit

Inclusion 4--Landform: Drainageways

***Major Component Description******Carstump Series****Elevation:* 6,000 to 7,000 feet*Precipitation:* About 11 inches*Air temperature:* About 44 degrees*Frost-free season:* About 85 days*Surface layer texture:* Very gravelly loam*Drainage class:* Well drained*Dominant parent material:* Residuum derived from volcanic rocks***Reluctan Series****Elevation:* 6,000 to 7,000 feet*Precipitation:* About 12 inches*Air temperature:* About 44 degrees*Frost-free season:* About 85 days*Surface layer texture:* Cobbly loam*Drainage class:* Well drained*Dominant parent material:* Residuum and colluvium derived from volcanic rocks***Ninemile Series****Elevation:* 6,000 to 7,000 feet*Precipitation:* About 14 inches*Air temperature:* About 44 degrees*Frost-free season:* About 85 days*Surface layer texture:* Very cobbly loam*Drainage class:* Well drained*Dominant parent material:* Residuum derived from volcanic rocks***Dominant Present Vegetation***

Carstump: Bluegrass, bottlebrush squirreltail, cheatgrass

Reluctan: Bluegrass, bottlebrush squirreltail, rabbitbrush

Ninemile: Bluegrass, bottlebrush squirreltail

Inclusion 1: None

Inclusion 2: Idaho fescue

Inclusion 3: Bluegrass, bottlebrush squirreltail

Inclusion 4: Rush, tufted hairgrass, willow

***Ecological Site***

Carstump: 025XY014NV

Reluctan: 025XY012NV

Ninemile: 025XY017NV

Inclusion 1: None

Inclusion 2: 025XY010NV

Inclusion 3: 025XY024NV

Inclusion 4: 025XY005NV

**1685--Carstump-Ninemile-Graley association*****Composition******Major Components***

Carstump very gravelly loam, 30 to 50 percent slopes--35 percent

Ninemile very cobbly loam, 15 to 30 percent slopes--30 percent

Graley very cobbly loam, 30 to 50 percent slopes--20 percent

***Contrasting Inclusions***

Inclusion 1: Rock outcrop--6 percent

Inclusion 2: Welch silt loam, 0 to 2 percent slopes, frequently flooded--3 percent

Inclusion 3: Welch silt loam, 0 to 2 percent slopes, occasionally flooded--3 percent

Inclusion 4: Welch silt loam, drained, 0 to 2 percent slopes, rarely flooded--3 percent

***Map Unit Setting***

*Landscape position:* Mountains

Carstump--Landform: Mountains; geomorphic position: backslope; aspect: south

Ninemile--Landform: Mountains; geomorphic position: backslope; shape of slope: convex

Graley--Landform: Mountains; geomorphic position: backslope; aspect: north

Inclusion 1--Landform: Mountains; geomorphic position: summit

Inclusion 2--Landform: Drainageways

Inclusion 3--Landform: Drainageways

Inclusion 4--Landform: Drainageways

***Major Component Description******Carstump Series***

*Elevation:* 6,000 to 7,000 feet

*Precipitation:* About 11 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Very gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from volcanic rocks

***Ninemile Series***

*Elevation:* 6,000 to 7,000 feet

*Precipitation:* About 14 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Very cobbly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from volcanic rocks

***Graley Series***

*Elevation:* 6,000 to 7,000 feet

*Precipitation:* About 14 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Very cobbly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from volcanic rocks

***Dominant Present Vegetation***

Carstump: Bluegrass, bottlebrush squirreltail, cheatgrass

Ninemile: Bluegrass, bottlebrush squirreltail

Graley: Idaho fescue, antelope bitterbrush, bluebunch wheatgrass

Inclusion 1: None

Inclusion 2: Rush, tufted hairgrass, willow

Inclusion 3: Alpine timothy

Inclusion 4: Basin wildrye, bluegrass

***Ecological Site***

Carstump: 025XY014NV

Ninemile: 025XY017NV

Graley: 025XY012NV

Inclusion 1: None

Inclusion 2: 025XY005NV

Inclusion 3: 025XY006NV

Inclusion 4: 025XY003NV

**1686--Carstump-Reluctan-Ninemile association, steep*****Composition******Major Components***

Carstump gravelly loam, 30 to 50 percent slopes--35 percent

Reluctan cobbly loam, 30 to 50 percent slopes--30 percent

Ninemile very stony loam, 4 to 15 percent slopes--20 percent

***Contrasting Inclusions***

Inclusion 1: Rock outcrop--5 percent

Inclusion 2: Shively loam, 30 to 50 percent slopes--5 percent

Inclusion 3: Welch silt loam, drained, 0 to 2 percent slopes, rarely flooded--3 percent

Inclusion 4: Welch silt loam, 0 to 2 percent slopes, frequently flooded--2 percent

***Map Unit Setting***

*Landscape position:* Mountains

Carstump--Landform: Mountains; geomorphic position: backslope; aspect: south

Reluctan--Landform: Mountains; geomorphic position: backslope; shape of slope: concave; aspect: north

Ninemile--Landform: Mountains; geomorphic position: summit; position on slope: upper; shape of slope: convex

Inclusion 1--Landform: Mountains; geomorphic position: summit

Inclusion 2--Landform: Mountains; geomorphic position: backslope; position on slope: upper part

Inclusion 3--Landform: Drainageways

Inclusion 4--Landform: Drainageways



**Major Component Description****Carstump Series***Elevation:* 6,000 to 7,000 feet*Precipitation:* About 11 inches*Air temperature:* About 44 degrees*Frost-free season:* About 85 days*Surface layer texture:* Gravelly loam*Drainage class:* Well drained*Dominant parent material:* Residuum derived from volcanic rocks**Reluctan Series***Elevation:* 6,000 to 7,000 feet*Precipitation:* About 12 inches*Air temperature:* About 44 degrees*Frost-free season:* About 85 days*Surface layer texture:* Cobbly loam*Drainage class:* Well drained*Dominant parent material:* Residuum and colluvium derived from volcanic rocks**Ninemile Series***Elevation:* 6,500 to 7,000 feet*Precipitation:* About 14 inches*Air temperature:* About 44 degrees*Frost-free season:* About 85 days*Surface layer texture:* Very stony loam*Drainage class:* Well drained*Dominant parent material:* Residuum derived from volcanic rocks**Dominant Present Vegetation**

Carstump: Bluegrass, bottlebrush squirreltail, cheatgrass

Reluctan: Bluegrass, bottlebrush squirreltail, rabbitbrush

Ninemile: Bluegrass, bottlebrush squirreltail

Inclusion 1: None

Inclusion 2: Idaho fescue

Inclusion 3: Basin wildrye, bluegrass

Inclusion 4: Rush, tufted hairgrass, willow

**Ecological Site**

Carstump: 025XY014NV

Reluctan: 025XY012NV

Ninemile: 025XY017NV

Inclusion 1: None

Inclusion 2: 025XY010NV

Inclusion 3: 025XY003NV

Inclusion 4: 025XY005NV

**1687--Carstump, cobbly loam-Linkup-Carstump association****Composition****Major Components**

Carstump cobbly loam, 15 to 50 percent slopes--35 percent

Linkup cobbly loam, 4 to 15 percent slopes--35 percent

Carstump gravelly loam, 4 to 15 percent slopes--15 percent

**Contrasting Inclusions**

Inclusion 1: Rock outcrop--7 percent

Inclusion 2: Graley very gravelly loam, 15 to 30 percent slopes--5 percent

Inclusion 3: Welch silt loam, drained, 0 to 2 percent slopes, rarely flooded--2 percent

Inclusion 4: Rubble land fragmental material--1 percent

**Map Unit Setting***Landscape position:* Mountains

Carstump--Landform: Mountains; geomorphic position: backslope

Linkup--Landform: Mountains; geomorphic position: summit; position on slope: upper part

Carstump--Landform: Mountains; geomorphic position: backslope; position on slope: lower part

Inclusion 1--Landform: Mountains; geomorphic position: summit

Inclusion 2--Landform: Mountains; geomorphic position: backslope; aspect: north

Inclusion 3--Landform: Drainageways

Inclusion 4--Landform: Mountains; geomorphic position: backslope

**Major Component Description****Carstump Series***Elevation:* 5,500 to 7,000 feet*Precipitation:* About 11 inches*Air temperature:* About 44 degrees*Frost-free season:* About 85 days*Surface layer texture:* Cobbly loam*Drainage class:* Well drained*Dominant parent material:* Residuum derived from volcanic rocks**Linkup Series***Elevation:* 5,500 to 7,000 feet*Precipitation:* About 11 inches*Air temperature:* About 44 degrees*Frost-free season:* About 85 days*Surface layer texture:* Cobbly loam*Drainage class:* Well drained*Dominant parent material:* Residuum and colluvium derived from volcanic rocks**Carstump Series***Elevation:* 5,500 to 6,500 feet*Precipitation:* About 11 inches*Air temperature:* About 44 degrees*Frost-free season:* About 85 days*Surface layer texture:* Gravelly loam*Drainage class:* Well drained*Dominant parent material:* Residuum derived from volcanic rocks**Dominant Present Vegetation**

Carstump: Bluegrass, bottlebrush squirreltail, cheatgrass

Linkup: Bluegrass, bottlebrush squirreltail

Carstump: Bluegrass, bottlebrush squirreltail,  
cheatgrass  
Inclusion 1: None  
Inclusion 2: Idaho fescue, antelope bitterbrush  
Inclusion 3: Basin wildrye, bluegrass  
Inclusion 4: None

#### ***Ecological Site***

Carstump: 025XY014NV  
Linkup: 025XY018NV  
Carstump: 025XY014NV  
Inclusion 1: None  
Inclusion 2: 025XY012NV  
Inclusion 3: 025XY003NV  
Inclusion 4: None

### **1691--Peguop-Rock outcrop-Rubble land association**

#### ***Composition***

#### ***Major Components***

Peguop gravelly loam, 30 to 50 percent slopes--40 percent  
Rock outcrop--25 percent  
Rubble land fragmental material, 30 to 50 percent slopes--25 percent  
**Contrasting Inclusions**  
Inclusion 1: Graley very gravelly loam, 30 to 75 percent slopes--10 percent

#### ***Map Unit Setting***

**Landscape position:** Hills  
Peguop--Landform: Hills; geomorphic position: backslope; aspect: north  
Rock outcrop--Landform: Hills; geomorphic position: backslope  
Rubble land--Landform: Hills; geomorphic position: backslope  
Inclusion 1--Landform: Hills; geomorphic position: backslope; aspect: north

#### ***Major Component Description***

#### ***Peguop Series***

**Elevation:** 5,000 to 6,500 feet  
**Precipitation:** About 14 inches  
**Air temperature:** About 44 degrees  
**Frost-free season:** About 85 days  
**Surface layer texture:** Gravelly loam  
**Drainage class:** Well drained  
**Dominant parent material:** Residuum and colluvium derived from volcanic rocks

#### ***Rock outcrop Miscellaneous Area***

**Elevation:** 5,000 to 6,500 feet  
**Drainage class:** Excessively drained

#### ***Rubble land Miscellaneous Area***

**Elevation:** 5,000 to 6,500 feet  
**Surface layer texture:** Fragmental material  
**Drainage class:** Excessively drained

#### ***Dominant Present Vegetation***

Peguop: Idaho fescue, bluegrass  
Rock outcrop: None  
Rubble land: None  
Inclusion 1: Idaho fescue, bluegrass

#### ***Ecological Site***

Peguop: 025XY012NV  
Rubble land: None  
Rock outcrop: None  
Inclusion 1: 025XY012NV

### **1700--Cotant-Quarz-Ninemile association**

#### ***Composition***

#### ***Major Components***

Cotant gravelly clay loam, 15 to 50 percent slopes--40 percent  
Quarz very gravelly loam, 30 to 50 percent slopes--30 percent  
Ninemile very cobbly loam, 15 to 50 percent slopes--15 percent

#### ***Contrasting Inclusions***

Inclusion 1: Welch silt loam, 0 to 2 percent slopes, occasionally flooded--5 percent  
Inclusion 2: Pachic Argixerolls, loamy-skeletal, mixed, frigid very gravelly loam, 15 to 50 percent slopes--5 percent  
Inclusion 3: Welch silt loam, drained, 2 to 4 percent slopes, rarely flooded--3 percent  
Inclusion 4: Hapgood very gravelly loam, 15 to 50 percent slopes--2 percent

#### ***Map Unit Setting***

**Landscape position:** Hills  
Cotant--Landform: Hills; geomorphic position: summit; position on slope: lower part  
Quarz--Landform: Hills; geomorphic position: backslope; aspect: south  
Ninemile--Landform: Hills; geomorphic position: backslope; position on slope: upper part  
Inclusion 1--Landform: Drainageways  
Inclusion 2--Landform: Hills; geomorphic position: backslope; shape of slope: concave; aspect: north  
Inclusion 3--Landform: Drainageways  
Inclusion 4--Landform: Hills; geomorphic position: backslope; position on slope: upper; shape of slope: concave

#### ***Major Component Description***

#### ***Cotant Series***

**Elevation:** 5,800 to 6,300 feet  
**Precipitation:** About 14 inches  
**Air temperature:** About 44 degrees  
**Frost-free season:** About 85 days  
**Surface layer texture:** Gravelly clay loam  
**Drainage class:** Well drained  
**Dominant parent material:** Residuum derived from sedimentary rocks



**Quarz Series***Elevation:* 5,800 to 6,300 feet*Precipitation:* About 12 inches*Air temperature:* About 44 degrees*Frost-free season:* About 85 days*Surface layer texture:* Very gravelly loam*Drainage class:* Well drained*Dominant parent material:* Residuum and colluvium derived from sedimentary rocks**Ninemile Series***Elevation:* 5,800 to 6,300 feet*Precipitation:* About 14 inches*Air temperature:* About 44 degrees*Frost-free season:* About 85 days*Surface layer texture:* Very cobbly loam*Drainage class:* Well drained*Dominant parent material:* Residuum derived from volcanic rocks***Dominant Present Vegetation***

Cotant: Bluegrass, bottlebrush squirreltail

Quarz: Antelope bitterbrush, basin wildrye, bluebunch wheatgrass

Ninemile: Bluegrass, bottlebrush squirreltail

Inclusion 1: Alpine timothy

Inclusion 2: Idaho fescue, bluegrass

Inclusion 3: Basin wildrye, bluegrass

Inclusion 4: Idaho fescue, mountain brome

***Ecological Site***

Cotant: 025XY017NV

Quarz: 025XY009NV

Ninemile: 025XY017NV

Inclusion 1: 025XY006NV

Inclusion 2: 025XY012NV

Inclusion 3: 025XY003NV

Inclusion 4: 025XY004NV

**1702--Cotant-Mclvey-Blitzen association*****Composition******Major Components***

Cotant gravelly clay loam, 4 to 15 percent slopes--45 percent

Mclvey cobbly loam, 4 to 15 percent slopes--30 percent

Blitzen very gravelly clay loam, 15 to 30 percent slopes--15 percent

***Contrasting Inclusions***

Inclusion 1: Donna gravelly loam, 4 to 15 percent slopes--4 percent

Inclusion 2: Gochea gravelly loam, 4 to 15 percent slopes--3 percent

Inclusion 3: Pachic Argixerolls, fine, montmorillonitic, frigid very gravelly loam--3 percent

***Map Unit Setting****Landscape position:* Hills

Cotant--Landform: Hills; geomorphic position: summit

Mclvey--Landform: Hills; geomorphic position: backslope; aspect: north

Blitzen--Landform: Hills; geomorphic position: backslope; aspect: south

Inclusion 1--Landform: Fan remnants; geomorphic position: summit

Inclusion 2--Landform: Hills; geomorphic position: footslope

Inclusion 3--Landform: Hills; geomorphic position: backslope; shape of slope: concave; aspect: north

***Major Component Description******Cotant Series****Elevation:* 5,600 to 6,000 feet*Precipitation:* About 14 inches*Air temperature:* About 44 degrees*Frost-free season:* About 85 days*Surface layer texture:* Gravelly clay loam*Drainage class:* Well drained*Dominant parent material:* Residuum derived from tuffaceous rocks***Mclvey Series****Elevation:* 5,600 to 6,000 feet*Precipitation:* About 15 inches*Air temperature:* About 43 degrees*Frost-free season:* About 85 days*Surface layer texture:* Cobbly loam*Drainage class:* Well drained*Dominant parent material:* Colluvium derived from tuffaceous rocks***Blitzen Series****Elevation:* 5,600 to 6,000 feet*Precipitation:* About 13 inches*Air temperature:* About 43 degrees*Frost-free season:* About 85 days*Surface layer texture:* Very gravelly clay loam*Drainage class:* Well drained*Dominant parent material:* Residuum and colluvium derived from tuffaceous rocks***Dominant Present Vegetation***

Cotant: Bluegrass, bottlebrush squirreltail

Mclvey: Idaho fescue, antelope bitterbrush

Blitzen: Basin wildrye, bluebunch wheatgrass

Inclusion 1: Bluegrass, bottlebrush squirreltail

Inclusion 2: Bluegrass, bottlebrush squirreltail

Inclusion 3: Bluegrass, bottlebrush squirreltail

***Ecological Site***

Cotant: 025XY017NV

Mclvey: 025XY012NV

Blitzen: 025XY009NV

Inclusion 1: 025XY018NV

Inclusion 2: 025XY014NV

Inclusion 3: 025XY014NV

**1703--Cotant-Lerrow-Bullump association****Composition****Major Components**

Cotant gravelly clay loam, 15 to 50 percent slopes--45 percent

Lerrow cobbly loam, 15 to 50 percent slopes--25 percent

Bullump very gravelly loam, 30 to 50 percent slopes--20 percent

**Contrasting Inclusions**

Inclusion 1: Graley very cobbly loam, 15 to 30 percent slopes--5 percent

Inclusion 2: Typic Argixerolls, fine-loamy, mixed, frigid very gravelly loam, 15 to 30 percent slopes--4 percent

Inclusion 3: Rock outcrop--1 percent

**Map Unit Setting**

*Landscape position:* Hills

Cotant--Landform: Hills; geomorphic position: summit; shape of slope: convex

Lerrow--Landform: Hills; geomorphic position: backslope; aspect: south

Bullump--Landform: Hills; geomorphic position: backslope; position on slope: upper; shape of slope: concave

Inclusion 1--Landform: Hills; geomorphic position: shoulder

Inclusion 2--Landform: Hills; geomorphic position: footslope; aspect: north

Inclusion 3--Landform: Hills; geomorphic position: summit

**Major Component Description****Cotant Series**

*Elevation:* 6,200 to 6,700 feet

*Precipitation:* About 14 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Gravelly clay loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from tuffaceous rocks

**Lerrow Series**

*Elevation:* 6,200 to 6,700 feet

*Precipitation:* About 14 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Cobbly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from tuffaceous rocks

**Bullump Series**

*Elevation:* 6,200 to 6,700 feet

*Precipitation:* About 16 inches

*Air temperature:* About 43 degrees

*Frost-free season:* About 75 days

*Surface layer texture:* Very gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Colluvium derived from tuffaceous rocks

**Dominant Present Vegetation**

Cotant: Bluegrass, bottlebrush squirreltail, low sagebrush

Lerrow: Big sagebrush, bluebunch wheatgrass, cheatgrass

Bullump: Idaho fescue, basin wildrye, bluebunch wheatgrass, mountain brome

Inclusion 1: Idaho fescue, antelope bitterbrush, mountain big sagebrush

Inclusion 2: Idaho fescue, basin big sagebrush

Inclusion 3: None

**Ecological Site**

Cotant: 025XY017NV

Lerrow: 025XY009NV

Bullump: 025XY016NV

Inclusion 1: 025XY012NV

Inclusion 2: 025XY027NV

Inclusion 3: None

**1711--Reluctan-Ninemile-Cleavage association****Composition****Major Components**

Reluctan cobbly loam, 15 to 30 percent slopes--35 percent

Ninemile cobbly loam, 4 to 15 percent slopes--30 percent

Cleavage gravelly loam, 4 to 15 percent slopes--25 percent

**Contrasting Inclusions**

Inclusion 1: Hackwood silt loam, 4 to 15 percent slopes--3 percent

Inclusion 2: Welch silt loam, drained, 0 to 2 percent slopes, rarely flooded--3 percent

Inclusion 3: Welch silt loam, 0 to 2 percent slopes, frequently flooded--2 percent

Inclusion 4: Welch silt loam, 0 to 2 percent slopes, occasionally flooded--2 percent

**Map Unit Setting**

*Landscape position:* Mountains

Reluctan--Landform: Mountains; geomorphic position: backslope; aspect: north

Ninemile--Landform: Mountains; geomorphic position: summit; position on slope: lower part

Cleavage--Landform: Mountains; geomorphic position: summit; position on slope: upper part

Inclusion 1--Landform: Mountains; geomorphic position: backslope; shape of slope: concave; aspect: north

Inclusion 2--Landform: Drainageways

Inclusion 3--Landform: Drainageways

Inclusion 4--Landform: Drainageways



**Major Component Description****Reluctan Series***Elevation:* 6,000 to 7,500 feet*Precipitation:* About 12 inches*Air temperature:* About 44 degrees*Frost-free season:* About 85 days*Surface layer texture:* Cobbly loam*Drainage class:* Well drained*Dominant parent material:* Residuum and colluvium derived from volcanic rocks**Ninemile Series***Elevation:* 6,000 to 7,200 feet*Precipitation:* About 14 inches*Air temperature:* About 44 degrees*Frost-free season:* About 85 days*Surface layer texture:* Cobbly loam*Drainage class:* Well drained*Dominant parent material:* Residuum derived from volcanic rocks**Cleavage Series***Elevation:* 6,500 to 7,500 feet*Precipitation:* About 14 inches*Air temperature:* About 44 degrees*Frost-free season:* About 85 days*Surface layer texture:* Gravelly loam*Drainage class:* Well drained*Dominant parent material:* Residuum derived from volcanic rocks**Dominant Present Vegetation**

Reluctan: Bluegrass, bottlebrush squirreltail, mountain big sagebrush, rabbitbrush

Ninemile: Bluegrass, bottlebrush squirreltail, low sagebrush

Cleavage: Idaho fescue, bluegrass, bottlebrush squirreltail, low sagebrush

Inclusion 1: Mountain brome, quaking aspen, slender wheatgrass

Inclusion 2: Basin big sagebrush, basin wildrye, bluegrass

Inclusion 3: Rush, sedge, tufted hairgrass, willow

Inclusion 4: Nevada bluegrass, alpine timothy

**Ecological Site**

Reluctan: 025XY012NV

Ninemile: 025XY017NV

Cleavage: 025XY024NV

Inclusion 1: 025XY065NV

Inclusion 2: 025XY003NV

Inclusion 3: 025XY005NV

Inclusion 4: 025XY006NV

**1712--Reluctan-Sumine-Cleavage association****Composition****Major Components**

Reluctan cobbly loam, 15 to 50 percent slopes--55 percent

Sumine very gravelly loam, 30 to 50 percent slopes--15 percent

Cleavage very gravelly loam, 15 to 50 percent slopes--15 percent

**Contrasting Inclusions**

Inclusion 1: Hapgood very gravelly loam, 15 to 50 percent slopes--8 percent

Inclusion 2: Tweener very cobbly sandy loam, 15 to 50 percent slopes--3 percent

Inclusion 3: Tusel gravelly loam, 15 to 50 percent slopes--2 percent

Inclusion 4: Welch silt loam, 0 to 2 percent slopes, frequently flooded--2 percent

**Map Unit Setting***Landscape position:* Hills

Reluctan--Landform: Hills; geomorphic position: backslope; shape of slope: plane; aspect: north

Sumine--Landform: Hills; geomorphic position: backslope; aspect: south

Cleavage--Landform: Hills; geomorphic position: summit; shape of slope: convex

Inclusion 1--Landform: Hills; geomorphic position: backslope; shape of slope: concave; aspect: north

Inclusion 2--Landform: Hills; geomorphic position: backslope; shape of slope: convex

Inclusion 3--Landform: Hills; geomorphic position: backslope; position on slope: upper; aspect: north

Inclusion 4--Landform: Drainageways

**Major Component Description****Reluctan Series***Elevation:* 6,400 to 6,700 feet*Precipitation:* About 12 inches*Air temperature:* About 44 degrees*Frost-free season:* About 85 days*Surface layer texture:* Cobbly loam*Drainage class:* Well drained*Dominant parent material:* Residuum and colluvium derived from volcanic rocks**Sumine Series***Elevation:* 6,400 to 6,700 feet*Precipitation:* About 12 inches*Air temperature:* About 44 degrees*Frost-free season:* About 85 days*Surface layer texture:* Very gravelly loam*Drainage class:* Well drained*Dominant parent material:* Residuum and colluvium derived from volcanic rocks**Cleavage Series***Elevation:* 6,500 to 6,700 feet*Precipitation:* About 14 inches*Air temperature:* About 44 degrees*Frost-free season:* About 85 days*Surface layer texture:* Very gravelly loam*Drainage class:* Well drained*Dominant parent material:* Residuum derived from volcanic rocks

***Dominant Present Vegetation***

Reluctan: Bluegrass, bottlebrush squirreltail, mountain big sagebrush, rabbitbrush  
 Sumine: Antelope bitterbrush, cheatgrass, mountain big sagebrush  
 Cleavage: Idaho fescue, low sagebrush  
 Inclusion 1: Idaho fescue, mountain brome, snowberry  
 Inclusion 2: Idaho fescue, antelope bitterbrush, bluegrass  
 Inclusion 3: Idaho fescue, mountain big sagebrush  
 Inclusion 4: Rush, sedge, tufted hairgrass, willow

***Ecological Site***

Reluctan: 025XY012NV  
 Sumine: 025XY009NV  
 Cleavage: 025XY017NV  
 Inclusion 1: 025XY004NV  
 Inclusion 2: 025XY007NV  
 Inclusion 3: 025XY010NV  
 Inclusion 4: 025XY005NV

**1713--Reluctan-Erakatak-Rugar association*****Composition******Major Components***

Reluctan gravelly loam, 30 to 50 percent slopes--35 percent  
 Erakatak gravelly loam, 30 to 50 percent slopes--30 percent  
 Rugar loam, 15 to 50 percent slopes--20 percent

***Contrasting Inclusions***

Inclusion 1: Welch silt loam, 0 to 2 percent slopes, occasionally flooded--6 percent  
 Inclusion 2: Aridic Argixerolls gravelly loam, 8 to 30 percent slopes--3 percent  
 Inclusion 3: Hapgood very gravelly loam, 30 to 75 percent slopes--3 percent  
 Inclusion 4: Sumine very gravelly loam, 30 to 50 percent slopes--3 percent

***Map Unit Setting***

*Landscape position:* Mountains

Reluctan--Landform: Mountains; geomorphic position: footslope; position on slope: lower; shape of slope: convex

Erakatak--Landform: Mountains; geomorphic position: backslope; aspect: south

Rugar--Landform: Mountains; geomorphic position: footslope; shape of slope: concave

Inclusion 1--Landform: Drainageways

Inclusion 2--Landform: Mountains; geomorphic position: footslope

Inclusion 3--Landform: Mountains; geomorphic position: backslope; shape of slope: concave; aspect: north

Inclusion 4--Landform: Mountains; geomorphic position: backslope; aspect: south

***Major Component Description******Reluctan Series***

*Elevation:* 6,300 to 7,500 feet  
*Precipitation:* About 12 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

***Erakatak Series***

*Elevation:* 6,300 to 7,500 feet  
*Precipitation:* About 16 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

***Rugar Series***

*Elevation:* 6,300 to 7,500 feet  
*Precipitation:* About 16 inches  
*Air temperature:* About 43 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum derived from sedimentary rocks

***Dominant Present Vegetation***

Reluctan: Bluegrass, bottlebrush squirreltail, mountain big sagebrush, rabbitbrush  
 Erakatak: Basin wildrye, bluebunch wheatgrass, mountain big sagebrush  
 Rugar: Basin wildrye, bottlebrush squirreltail, mulesear wyethia, slender wheatgrass  
 Inclusion 1: Nevada bluegrass, alpine timothy  
 Inclusion 2: Idaho fescue, basin big sagebrush  
 Inclusion 3: Idaho fescue, mountain brome, snowberry  
 Inclusion 4: Big sagebrush, bluebunch wheatgrass, cheatgrass

***Ecological Site***

Reluctan: 025XY012NV  
 Erakatak: 025XY016NV  
 Rugar: 025XY047NV  
 Inclusion 1: 025XY006NV  
 Inclusion 2: 025XY027NV  
 Inclusion 3: 025XY004NV  
 Inclusion 4: 025XY009NV

**1720--Quarz-Alyan-Ninemile association*****Composition******Major Components***

Quarz very gravelly loam, 15 to 50 percent slopes--35 percent



Alyan cobbly loam, 15 to 50 percent slopes--35 percent  
 Ninemile very cobbly loam, 15 to 30 percent slopes--25 percent

**Contrasting Inclusions**

Inclusion 1: Rock outcrop--5 percent

**Map Unit Setting**

*Landscape position:* Hills

Quarz--Landform: Hills; geomorphic position: backslope; aspect: south

Alyan--Landform: Hills; geomorphic position: backslope; aspect: north

Ninemile--Landform: Hills; geomorphic position: summit; position on slope: upper; shape of slope: convex

Inclusion 1--Landform: Hills; geomorphic position: summit

**Major Component Description**

**Quarz Series**

*Elevation:* 5,500 to 6,200 feet

*Precipitation:* About 12 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Very gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

**Alyan Series**

*Elevation:* 5,500 to 6,200 feet

*Precipitation:* About 12 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Cobbly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

**Ninemile Series**

*Elevation:* 5,500 to 6,200 feet

*Precipitation:* About 14 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Very cobbly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from volcanic rocks

**Dominant Present Vegetation**

Quarz: Antelope bitterbrush, basin wildrye, big sagebrush, bluebunch wheatgrass

Alyan: Idaho fescue, bluegrass, mountain big sagebrush

Ninemile: Bluegrass, bottlebrush squirreltail, low sagebrush

Inclusion 1: None

**Ecological Site**

Quarz: 025XY009NV

Alyan: 025XY012NV

Ninemile: 025XY017NV

Inclusion 1: None

**1725--Quarz-Cleavage-Loncan association**

**Composition**

**Major Components**

Quarz very stony loam, 15 to 50 percent slopes--35 percent

Cleavage extremely gravelly loam, 15 to 50 percent slopes--25 percent

Loncan very gravelly loam, 15 to 50 percent slopes--25 percent

**Contrasting Inclusions**

Inclusion 1: Rock outcrop--7 percent

Inclusion 2: Typic Argixerolls, fine, montmorillonitic, frigid very gravelly loam--5 percent

Inclusion 3: Crooked Creek gravelly silty clay loam, 0 to 2 percent slopes, occasionally flooded--3 percent

**Map Unit Setting**

*Landscape position:* Mountains

Quarz--Landform: Mountains; geomorphic position: backslope; aspect: south

Cleavage--Landform: Mountains; geomorphic position: summit; position on slope: upper part

Loncan--Landform: Mountains; geomorphic position: backslope; shape of slope: convex; aspect: north

Inclusion 1--Landform: Mountains; geomorphic position: summit

Inclusion 2--Landform: Mountains; geomorphic position: backslope

Inclusion 3--Landform: Drainageways

**Major Component Description**

**Quarz Series**

*Elevation:* 6,200 to 7,200 feet

*Precipitation:* About 12 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Very stony loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from tuffaceous rocks

**Cleavage Series**

*Elevation:* 6,500 to 7,500 feet

*Precipitation:* About 14 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Extremely gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from tuffaceous rocks

**Loncan Series**

*Elevation:* 6,200 to 7,500 feet

*Precipitation:* About 14 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Very gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from tuffaceous rocks

#### ***Dominant Present Vegetation***

Quarz: Antelope bitterbrush, basin wildrye, big sagebrush, bluebunch wheatgrass  
 Cleavage: Idaho fescue, low sagebrush  
 Loncan: Idaho fescue, antelope bitterbrush, mountain big sagebrush  
 Inclusion 1: None  
 Inclusion 2: Idaho fescue, mountain big sagebrush  
 Inclusion 3: Nevada bluegrass, alpine timothy, sedge

#### ***Ecological Site***

Quarz: 025XY009NV  
 Cleavage: 025XY024NV  
 Loncan: 025XY012NV  
 Inclusion 1: None  
 Inclusion 2: 025XY012NV  
 Inclusion 3: 025XY006NV

### **1726--Quarz-Ninemile-Pequop association**

#### ***Composition***

##### ***Major Components***

Quarz very gravelly loam, 15 to 30 percent slopes--35 percent  
 Ninemile gravelly loam, 15 to 30 percent slopes--35 percent  
 Pequop gravelly loam, 30 to 50 percent slopes--20 percent

##### ***Contrasting Inclusions***

Inclusion 1: Rock outcrop--5 percent  
 Inclusion 2: Shively loam, 30 to 50 percent slopes--5 percent

#### ***Map Unit Setting***

*Landscape position:* Mountains  
 Quarz--Landform: Mountains; geomorphic position: backslope; aspect: south  
 Ninemile--Landform: Mountains; geomorphic position: backslope; aspect: south  
 Pequop--Landform: Mountains; geomorphic position: backslope; shape of slope: plane; aspect: north  
 Inclusion 1--Landform: Mountains; geomorphic position: summit  
 Inclusion 2--Landform: Mountains; geomorphic position: backslope; shape of slope: concave; aspect: north

#### ***Major Component Description***

##### ***Quarz Series***

*Elevation:* 5,300 to 6,300 feet  
*Precipitation:* About 12 inches  
*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days  
*Surface layer texture:* Very gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

##### ***Ninemile Series***

*Elevation:* 5,300 to 6,300 feet  
*Precipitation:* About 14 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum derived from volcanic rocks

##### ***Pequop Series***

*Elevation:* 5,300 to 6,300 feet  
*Precipitation:* About 14 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

#### ***Dominant Present Vegetation***

Quarz: Antelope bitterbrush, basin wildrye, big sagebrush, bluebunch wheatgrass  
 Ninemile: Bluegrass, bottlebrush squirreltail, low sagebrush  
 Pequop: Idaho fescue, bluegrass, mountain big sagebrush  
 Inclusion 1: None  
 Inclusion 2: Idaho fescue, mountain big sagebrush

#### ***Ecological Site***

Quarz: 025XY009NV  
 Ninemile: 025XY017NV  
 Pequop: 025XY012NV  
 Inclusion 1: None  
 Inclusion 2: 025XY010NV

### **1730--Graley-Erakatak-Chen association**

#### ***Composition***

##### ***Major Components***

Graley very gravelly loam, 30 to 50 percent slopes--40 percent  
 Erakatak very gravelly loam, 15 to 50 percent slopes--30 percent  
 Chen very gravelly loam, 4 to 15 percent slopes--15 percent

##### ***Contrasting Inclusions***

Inclusion 1: Argic Pachic Cryoborolls, clayey-skeletal, montmorillonitic gravelly loam, 15 to 30 percent slopes--10 percent  
 Inclusion 2: Pachic Palexerolls, fine, montmorillonitic, frigid gravelly loam, 4 to 15 percent slopes--5 percent



**Map Unit Setting***Landscape position:* Hills*Graley--Landform:* Hills; geomorphic position: backslope; shape of slope: plane*Erakatak--Landform:* Hills; geomorphic position: backslope; aspect: south*Chen--Landform:* Hills; geomorphic position: summit; shape of slope: convex*Inclusion 1--Landform:* Hills; geomorphic position: backslope; shape of slope: concave; aspect: north*Inclusion 2--Landform:* Hills; geomorphic position: backslope; shape of slope: plane; aspect: north**Major Component Description****Graley Series***Elevation:* 6,000 to 7,200 feet*Precipitation:* About 14 inches*Air temperature:* About 44 degrees*Frost-free season:* About 85 days*Surface layer texture:* Very gravelly loam*Drainage class:* Well drained*Dominant parent material:* Residuum derived from tuffaceous rocks**Erakatak Series***Elevation:* 6,000 to 7,200 feet*Precipitation:* About 16 inches*Air temperature:* About 44 degrees*Frost-free season:* About 85 days*Surface layer texture:* Very gravelly loam*Drainage class:* Well drained*Dominant parent material:* Residuum and colluvium derived from volcanic rocks**Chen Series***Elevation:* 6,000 to 7,200 feet*Precipitation:* About 12 inches*Air temperature:* About 44 degrees*Frost-free season:* About 85 days*Surface layer texture:* Very gravelly loam*Drainage class:* Well drained*Dominant parent material:* Residuum and colluvium derived from tuffaceous rocks**Dominant Present Vegetation***Graley:* Idaho fescue, antelope bitterbrush, bluebunch wheatgrass, mountain big sagebrush*Erakatak:* Basin wildrye, bluebunch wheatgrass, mountain big sagebrush*Chen:* Bluegrass, bottlebrush squirreltail, low sagebrush*Inclusion 1:* Idaho fescue, mountain brome, snowberry*Inclusion 2:* Idaho fescue, bluegrass, low sagebrush**Ecological Site***Graley:* 025XY012NV*Erakatak:* 025XY016NV*Chen:* 025XY017NV*Inclusion 1:* 025XY004NV*Inclusion 2:* 025XY017NV**1732--Graley-Quarz-Ninemile association****Composition****Major Components***Graley* very stony loam, 30 to 50 percent slopes--40 percent*Quarz* very gravelly loam, 30 to 50 percent slopes--30 percent*Ninemile* very cobbly loam, 15 to 30 percent slopes--15 percent**Contrasting Inclusions***Inclusion 1:* Rock outcrop--8 percent*Inclusion 2:* Shively loam, 30 to 50 percent slopes--4 percent*Inclusion 3:* Cleavage extremely gravelly loam, 15 to 50 percent slopes--3 percent**Map Unit Setting***Landscape position:* Mountains*Graley--Landform:* Mountains; geomorphic position: backslope; shape of slope: plane; aspect: north*Quarz--Landform:* Mountains; geomorphic position: backslope; aspect: south*Ninemile--Landform:* Mountains; geomorphic position: summit; position on slope: lower part*Inclusion 1--Landform:* Mountains; geomorphic position: summit*Inclusion 2--Landform:* Mountains; geomorphic position: backslope; shape of slope: concave; aspect: north*Inclusion 3--Landform:* Mountains; geomorphic position: summit; shape of slope: convex**Major Component Description****Graley Series***Elevation:* 5,700 to 6,500 feet*Precipitation:* About 14 inches*Air temperature:* About 44 degrees*Frost-free season:* About 85 days*Surface layer texture:* Very stony loam*Drainage class:* Well drained*Dominant parent material:* Residuum derived from volcanic rocks**Quarz Series***Elevation:* 5,700 to 6,500 feet*Precipitation:* About 12 inches*Air temperature:* About 44 degrees*Frost-free season:* About 85 days*Surface layer texture:* Very gravelly loam*Drainage class:* Well drained*Dominant parent material:* Residuum and colluvium derived from volcanic rocks**Ninemile Series***Elevation:* 5,700 to 6,200 feet*Precipitation:* About 14 inches*Air temperature:* About 44 degrees*Frost-free season:* About 85 days*Surface layer texture:* Very cobbly loam*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from volcanic rocks

### ***Dominant Present Vegetation***

Graley: Idaho fescue, antelope bitterbrush, bluebunch wheatgrass, mountain big sagebrush

Quarz: Antelope bitterbrush, basin wildrye, big sagebrush, bluebunch wheatgrass

Ninemile: Bluegrass, bottlebrush squirreltail, low sagebrush

Inclusion 1: None

Inclusion 2: Idaho fescue, mountain big sagebrush

Inclusion 3: Bluegrass, low sagebrush

### ***Ecological Site***

Graley: 025XY012NV

Quarz: 025XY009NV

Ninemile: 025XY017NV

Inclusion 1: None

Inclusion 2: 025XY010NV

Inclusion 3: 025XY024NV

## **1733--Graley-Loncan association**

### ***Composition***

#### ***Major Components***

Graley very stony loam, 15 to 50 percent slopes--55 percent

Loncan very gravelly loam, 30 to 50 percent slopes--30 percent

#### ***Contrasting Inclusions***

Inclusion 1: Quarz very gravelly loam, 15 to 50 percent slopes--9 percent

Inclusion 2: Ninemile gravelly loam, 4 to 15 percent slopes--5 percent

Inclusion 3: Rock outcrop--1 percent

### ***Map Unit Setting***

*Landscape position:* Mountains

Graley--Landform: Mountains; geomorphic position: backslope; shape of slope: convex

Loncan--Landform: Mountains; geomorphic position: backslope; shape of slope: concave; aspect: north

Inclusion 1--Landform: Mountains; geomorphic position: backslope; shape of slope: concave; aspect: south

Inclusion 2--Landform: Mountains; geomorphic position: summit

Inclusion 3--Landform: Mountains; geomorphic position: backslope

### ***Major Component Description***

#### ***Graley Series***

*Elevation:* 5,500 to 6,400 feet

*Precipitation:* About 14 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Very stony loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from volcanic rocks

### ***Loncan Series***

*Elevation:* 5,500 to 6,400 feet

*Precipitation:* About 14 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Very gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

### ***Dominant Present Vegetation***

Graley: Idaho fescue, bluebunch wheatgrass, mountain big sagebrush

Loncan: Idaho fescue, antelope bitterbrush, mountain big sagebrush

Inclusion 1: Big sagebrush, bluebunch wheatgrass, cheatgrass

Inclusion 2: Bluegrass, bottlebrush squirreltail, low sagebrush

Inclusion 3: None

### ***Ecological Site***

Graley: 025XY012NV

Loncan: 025XY012NV

Inclusion 1: 025XY009NV

Inclusion 2: 025XY017NV

Inclusion 3: None

## **1740--Erakatak-Cleavage-Hackwood association**

### ***Composition***

#### ***Major Components***

Erakatak very gravelly loam, 15 to 50 percent slopes--40 percent

Cleavage extremely gravelly loam, 4 to 15 percent slopes--30 percent

Hackwood silt loam, 15 to 50 percent slopes--15 percent

#### ***Contrasting Inclusions***

Inclusion 1: Sumine very gravelly loam, 50 to 75 percent slopes--5 percent

Inclusion 2: Hapgood very gravelly loam, 30 to 50 percent slopes--4 percent

Inclusion 3: Typic Argixerolls, clayey-skeletal, montmorillonitic, frigid very gravelly loam, 8 to 15 percent slopes--4 percent

Inclusion 4: Crooked Creek gravelly silty clay loam, 0 to 2 percent slopes, occasionally flooded--2 percent

### ***Map Unit Setting***

*Landscape position:* Mountains and foothills

Erakatak--Landform: Mountains; geomorphic position: backslope; aspect: south

Cleavage--Landform: Mountains; geomorphic position: summit; position on slope: upper; shape of slope: convex



Hackwood--Landform: Mountains; geomorphic position: backslope; shape of slope: concave; aspect: north

Inclusion 1--Landform: Mountains; geomorphic position: backslope; position on slope: lower; aspect: south

Inclusion 2--Landform: Mountains; geomorphic position: backslope; shape of slope: plane; aspect: north

Inclusion 3--Landform: Mountains; geomorphic position: footslope

Inclusion 4--Landform: Drainageways

### **Major Component Description**

#### **Erakatak Series**

*Elevation:* 6,000 to 7,800 feet

*Precipitation:* About 16 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Very gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from sedimentary rocks

#### **Cleavage Series**

*Elevation:* 6,400 to 7,800 feet

*Precipitation:* About 14 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Extremely gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from sedimentary rocks

#### **Hackwood Series**

*Elevation:* 6,000 to 7,800 feet

*Precipitation:* About 18 inches

*Air temperature:* About 42 degrees

*Frost-free season:* About 60 days

*Surface layer texture:* Silt loam

*Drainage class:* Well drained

*Dominant parent material:* Colluvium derived from sedimentary rocks

### **Dominant Present Vegetation**

Erakatak: Basin wildrye, bluebunch wheatgrass, mountain big sagebrush

Cleavage: Idaho fescue, bluegrass, bottlebrush squirreltail, low sagebrush

Hackwood: Mountain brome, quaking aspen, slender wheatgrass

Inclusion 1: Big sagebrush, bluebunch wheatgrass, cheatgrass

Inclusion 2: Idaho fescue, mountain brome, snowberry

Inclusion 3: Idaho fescue, basin big sagebrush

Inclusion 4: Nevada bluegrass, alpine timothy

### **Ecological Site**

Erakatak: 025XY016NV

Cleavage: 025XY024NV

Hackwood: 025XY065NV

Inclusion 1: 025XY009NV

Inclusion 2: 025XY004NV

Inclusion 3: 025XY027NV

Inclusion 4: 025XY006NV

## **1741--Erakatak-Chen-Tusk association**

### **Composition**

#### **Major Components**

Erakatak very gravelly clay loam, 30 to 50 percent slopes--40 percent

Chen very gravelly sandy clay loam, 4 to 15 percent slopes--25 percent

Tusk gravelly loam, 30 to 50 percent slopes--20 percent

#### **Contrasting Inclusions**

Inclusion 1: Lithic Argixerolls, clayey-skeletal, montmorillonitic, frigid very gravelly loam--6 percent

Inclusion 2: Aridic Argixerolls, fine-loamy, mixed, frigid gravelly loam, 30 to 50 percent slopes--4 percent

Inclusion 3: Welch silt loam, drained, 0 to 2 percent slopes, rarely flooded--3 percent

Inclusion 4: Welch silt loam, 0 to 2 percent slopes, occasionally flooded--2 percent

### **Map Unit Setting**

*Landscape position:* Hills

Erakatak--Landform: Hills; geomorphic position: backslope; shape of slope: convex; aspect: south

Chen--Landform: Hills; geomorphic position: summit; shape of slope: convex

Tusk--Landform: Hills; geomorphic position: backslope; shape of slope: plane; aspect: north

Inclusion 1--Landform: Hills; geomorphic position: backslope; shape of slope: convex; aspect: north

Inclusion 2--Landform: Hills; geomorphic position: backslope; shape of slope: concave; aspect: north

Inclusion 3--Landform: Drainageways

Inclusion 4--Landform: Drainageways

### **Major Component Description**

#### **Erakatak Series**

*Elevation:* 5,500 to 7,000 feet

*Precipitation:* About 16 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Very gravelly clay loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from sedimentary rocks

#### **Chen Series**

*Elevation:* 5,500 to 7,000 feet

*Precipitation:* About 12 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Very gravelly sandy clay loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from sedimentary rocks

**Tusk Series***Elevation:* 5,500 to 7,000 feet*Precipitation:* About 14 inches*Air temperature:* About 44 degrees*Frost-free season:* About 85 days*Surface layer texture:* Gravelly loam*Drainage class:* Well drained*Dominant parent material:* Colluvium derived from mixed rocks***Dominant Present Vegetation***

Erakatak: Basin wildrye, bluebunch wheatgrass, mountain big sagebrush

Chen: Bluegrass, bottlebrush squirreltail, low sagebrush

Tusk: Cheatgrass, mountain big sagebrush, rabbitbrush, snowberry

Inclusion 1: Idaho fescue, antelope bitterbrush, mountain big sagebrush

Inclusion 2: Idaho fescue, antelope bitterbrush, mountain big sagebrush

Inclusion 3: Basin big sagebrush, basin wildrye, bluegrass

Inclusion 4: Nevada bluegrass, alpine timothy

***Ecological Site***

Erakatak: 025XY016NV

Chen: 025XY017NV

Tusk: 025XY004NV

Inclusion 1: 025XY012NV

Inclusion 2: 025XY012NV

Inclusion 3: 025XY003NV

Inclusion 4: 025XY006NV

**1742--Erakatak-Rugar-Tusel association*****Composition******Major Components***

Erakatak gravelly loam, 15 to 50 percent slopes--40 percent

Rugar clay loam, 15 to 30 percent slopes--25 percent

Tusel very gravelly loam, 15 to 30 percent slopes--20 percent

***Contrasting Inclusions***

Inclusion 1: Lithic Argixerolls, clayey-skeletal, mixed, frigid very gravelly loam, 8 to 30 percent slopes--7 percent

Inclusion 2: Graley very gravelly loam, 15 to 50 percent slopes--5 percent

Inclusion 3: Tusel gravelly loam, 8 to 15 percent slopes--2 percent

Inclusion 4: Typic Argixerolls, loamy-skeletal, mixed, frigid very gravelly loam--1 percent

***Map Unit Setting****Landscape position:* Hills

Erakatak--Landform: Hills; geomorphic position: backslope; aspect: south

Rugar--Landform: Hills; geomorphic position: footslope; shape of slope: concave

Tusel--Landform: Hills; geomorphic position: backslope; shape of slope: concave; aspect: north

Inclusion 1--Landform: Hills; geomorphic position:

backslope; shape of slope: convex; aspect: south

Inclusion 2--Landform: Hills; geomorphic position:

backslope; shape of slope: plane

Inclusion 3--Landform: Hills; geomorphic position:

shoulder; shape of slope: convex; aspect: north

Inclusion 4--Landform: Hills; geomorphic position:

backslope; position on slope: lower part

***Major Component Description*****Erakatak Series***Elevation:* 5,800 to 6,800 feet*Precipitation:* About 16 inches*Air temperature:* About 44 degrees*Frost-free season:* About 85 days*Surface layer texture:* Gravelly loam*Drainage class:* Well drained*Dominant parent material:* Residuum and colluvium derived from sedimentary rocks**Rugar Series***Elevation:* 5,800 to 6,800 feet*Precipitation:* About 16 inches*Air temperature:* About 43 degrees*Frost-free season:* About 85 days*Surface layer texture:* Clay loam*Drainage class:* Well drained*Dominant parent material:* Residuum derived from sedimentary rocks**Tusel Series***Elevation:* 5,800 to 6,800 feet*Precipitation:* About 18 inches*Air temperature:* About 42 degrees*Frost-free season:* About 60 days*Surface layer texture:* Very gravelly loam*Drainage class:* Well drained*Dominant parent material:* Residuum and colluvium derived from sedimentary rocks***Dominant Present Vegetation***

Erakatak: Basin wildrye, bluebunch wheatgrass, mountain big sagebrush

Rugar: Basin wildrye, mulesear wyethia, slender wheatgrass

Tusel: Mountain brome, snowberry

Inclusion 1: Idaho fescue, bluegrass, serviceberry

Inclusion 2: Idaho fescue, antelope bitterbrush, mountain big sagebrush

Inclusion 3: Idaho fescue, mountain big sagebrush

Inclusion 4: Idaho fescue, basin big sagebrush

***Ecological Site***

Erakatak: 025XY016NV

Rugar: 025XY047NV

Tusel: 025XY004NV

Inclusion 1: 025XY046NV

Inclusion 2: 025XY012NV

Inclusion 3: 025XY010NV



Inclusion 4: 025XY027NV

## 1744--Erakatak-Graley-Tusel association

### *Composition*

#### **Major Components**

Erakatak very gravelly clay loam, 30 to 50 percent slopes--35 percent

Graley very gravelly loam, 15 to 50 percent slopes--30 percent

Tusel very gravelly loam, 15 to 30 percent slopes--20 percent

#### **Contrasting Inclusions**

Inclusion 1: Typic Argixerolls, clayey-skeletal, montmorillonitic, frigid very gravelly loam, 15 to 50 percent slopes--6 percent

Inclusion 2: Lithic Argixerolls, clayey-skeletal, montmorillonitic, frigid very gravelly loam, 15 to 50 percent slopes--4 percent

Inclusion 3: Rugar loam, 4 to 15 percent slopes--3 percent

Inclusion 4: Lithic Xerorthents, loamy-skeletal, mixed, frigid very gravelly loam, 30 to 50 percent slopes--2 percent

### *Map Unit Setting*

*Landscape position:* Hills

Erakatak--Landform: Hills; geomorphic position: backslope; aspect: south

Graley--Landform: Hills; geomorphic position: backslope; shape of slope: plane

Tusel--Landform: Hills; geomorphic position: backslope; shape of slope: concave; aspect: north

Inclusion 1--Landform: Hills; geomorphic position: backslope; aspect: south

Inclusion 2--Landform: Hills; geomorphic position: backslope; shape of slope: convex

Inclusion 3--Landform: Hills; geomorphic position: footslope; position on slope: lower part; shape of slope: plane

Inclusion 4--Landform: Hills; geomorphic position: shoulder

### *Major Component Description*

#### **Erakatak Series**

*Elevation:* 5,900 to 7,200 feet

*Precipitation:* About 16 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Very gravelly clay loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from sedimentary rocks

#### **Graley Series**

*Elevation:* 5,900 to 7,200 feet

*Precipitation:* About 14 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Very gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from sedimentary rocks

#### **Tusel Series**

*Elevation:* 5,900 to 7,200 feet

*Precipitation:* About 18 inches

*Air temperature:* About 42 degrees

*Frost-free season:* About 60 days

*Surface layer texture:* Very gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from sedimentary rocks

### *Dominant Present Vegetation*

Erakatak: Basin wildrye, bluebunch wheatgrass, mountain big sagebrush

Graley: Idaho fescue, antelope bitterbrush, bluebunch wheatgrass, mountain big sagebrush

Tusel: Idaho fescue, mountain brome, slender wheatgrass, snowberry

Inclusion 1: Big sagebrush, bluebunch wheatgrass, cheatgrass

Inclusion 2: Idaho fescue, bluegrass, serviceberry

Inclusion 3: Idaho fescue, mountain brome, wyethia

Inclusion 4: Idaho fescue, black sagebrush

### *Ecological Site*

Erakatak: 025XY016NV

Graley: 025XY012NV

Tusel: 025XY004NV

Inclusion 1: 025XY009NV

Inclusion 2: 025XY046NV

Inclusion 3: 025XY047NV

Inclusion 4: 024XY042NV

## 1746--Booford-Cotant-Blitzen association

### *Composition*

#### **Major Components**

Booford silt loam, 15 to 30 percent slopes--35 percent

Cotant gravelly clay loam, 15 to 30 percent slopes--35 percent

Blitzen gravelly clay loam, 15 to 50 percent slopes--15 percent

#### **Contrasting Inclusions**

Inclusion 1: Typic Argixerolls, fine, montmorillonitic, frigid very gravelly loam--6 percent

Inclusion 2: Tusel gravelly loam, 30 to 50 percent slopes--3 percent

Inclusion 3: Lithic Argixerolls, clayey-skeletal, montmorillonitic, frigid very gravelly loam--3 percent

Inclusion 4: Welch silt loam, drained, 0 to 2 percent slopes, rarely flooded--3 percent

### *Map Unit Setting*

*Landscape position:* Hills

Booford--Landform: Hills; geomorphic position: backslope; shape of slope: concave; aspect: north

Cotant--Landform: Hills; geomorphic position: summit;  
shape of slope: convex

Blitzen--Landform: Hills; geomorphic position:  
backslope; aspect: south

Inclusion 1--Landform: Hills; geomorphic position:  
backslope; shape of slope: concave; aspect: north

Inclusion 2--Landform: Hills; geomorphic position:  
backslope; position on slope: upper; aspect: north

Inclusion 3--Landform: Hills; geomorphic position:  
summit; shape of slope: convex

Inclusion 4--Landform: Drainageways

### ***Major Component Description***

#### **Booford Series**

*Elevation:* 5,600 to 6,400 feet

*Precipitation:* About 16 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Silt loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium  
derived from sedimentary rocks

#### **Cotant Series**

*Elevation:* 5,600 to 6,400 feet

*Precipitation:* About 14 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Gravelly clay loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from  
sedimentary rocks

#### **Blitzen Series**

*Elevation:* 5,600 to 6,400 feet

*Precipitation:* About 13 inches

*Air temperature:* About 43 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Gravelly clay loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium  
derived from sedimentary rocks

### ***Dominant Present Vegetation***

Booford: Idaho fescue, mountain big sagebrush,  
wheatgrass

Cotant: Bluegrass, bottlebrush squirreltail

Blitzen: Basin wildrye, bluebunch wheatgrass,  
mountain big sagebrush

Inclusion 1: Idaho fescue, antelope bitterbrush,  
mountain big sagebrush

Inclusion 2: Idaho fescue, mountain big sagebrush

Inclusion 3: Idaho fescue, bluegrass, serviceberry

Inclusion 4: Basin big sagebrush, basin wildrye,  
bluegrass

### ***Ecological Site***

Booford: 025XY012NV

Cotant: 025XY017NV

Blitzen: 025XY009NV

Inclusion 1: 025XY004NV

Inclusion 2: 025XY010NV

Inclusion 3: 025XY046NV

Inclusion 4: 025XY003NV

## **1800--Bregar, moderately steep-Bregar-Carstump association**

### ***Composition***

#### ***Major Components***

Bregar very gravelly loam, 15 to 30 percent slopes--45  
percent

Bregar very gravelly loam, 4 to 15 percent slopes--25  
percent

Carstump very cobbly loam, 30 to 50 percent slopes--  
20 percent

#### ***Contrasting Inclusions***

Inclusion 1: Rock outcrop--5 percent

Inclusion 2: Clementine silt loam, drained, 0 to 2  
percent slopes--4 percent

Inclusion 3: Clementine silt loam, 0 to 2 percent  
slopes--1 percent

### ***Map Unit Setting***

*Landscape position:* Mountains

Bregar--Landform: Mountains; geomorphic position:  
backslope; shape of slope: convex

Bregar--Landform: Mountains; geomorphic position:  
summit

Carstump--Landform: Mountains; geomorphic position:  
backslope; shape of slope: plane

Inclusion 1--Landform: Mountains; geomorphic  
position: backslope; position on slope: upper part;  
shape of slope: convex

Inclusion 2--Landform: Drainageways

Inclusion 3--Landform: Drainageways

### ***Major Component Description***

#### **Bregar Series**

*Elevation:* 6,000 to 7,500 feet

*Precipitation:* About 13 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Very gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium  
derived from volcanic rocks

#### **Bregar Series**

*Elevation:* 6,200 to 7,500 feet

*Precipitation:* About 13 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Very gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium  
derived from volcanic rocks

#### **Carstump Series**

*Elevation:* 6,000 to 7,500 feet

*Precipitation:* About 11 inches



*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Very cobbly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum derived from volcanic rocks

#### ***Dominant Present Vegetation***

Bregar: Bluegrass, low sagebrush  
 Bregar: Bluegrass, low sagebrush  
 Carstump: Big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass  
 Inclusion 1: None  
 Inclusion 2: Basin big sagebrush, basin wildrye, bluegrass  
 Inclusion 3: Rush, sedge, tufted hairgrass, willow

#### ***Ecological Site***

Bregar: 025XY018NV  
 Bregar: 025XY018NV  
 Carstump: 025XY014NV  
 Inclusion 1: None  
 Inclusion 2: 025XY003NV  
 Inclusion 3: 025XY005NV

### **1802--Bregar-Ninemile-Pequop association**

#### ***Composition***

##### ***Major Components***

Bregar very gravelly loam, eroded, 4 to 15 percent slopes--40 percent  
 Ninemile gravelly loam, 4 to 15 percent slopes--30 percent  
 Pequop gravelly loam, 15 to 30 percent slopes--15 percent

##### ***Contrasting Inclusions***

Inclusion 1: Rock outcrop--6 percent  
 Inclusion 2: Quarz very gravelly loam, 15 to 30 percent slopes--5 percent  
 Inclusion 3: Welch silt loam, drained, 2 to 8 percent slopes, rarely flooded--2 percent  
 Inclusion 4: Tweener very cobbly loam, 15 to 30 percent slopes--2 percent

#### ***Map Unit Setting***

*Landscape position:* Hills  
 Bregar--Landform: Hills; geomorphic position: summit; aspect: south  
 Ninemile--Landform: Hills; geomorphic position: toeslope; shape of slope: convex; aspect: north  
 Pequop--Landform: Hills; geomorphic position: toeslope; shape of slope: concave; aspect: north  
 Inclusion 1--Landform: Hills; geomorphic position: backslope; position on slope: upper part; shape of slope: convex  
 Inclusion 2--Landform: Hills; geomorphic position: backslope; aspect: south  
 Inclusion 3--Landform: Drainageways  
 Inclusion 4--Landform: Hills; geomorphic position: backslope

#### ***Major Component Description***

##### ***Bregar Series***

*Elevation:* 5,300 to 5,800 feet  
*Precipitation:* About 13 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Very gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

##### ***Ninemile Series***

*Elevation:* 5,300 to 5,800 feet  
*Precipitation:* About 14 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum derived from volcanic rocks

##### ***Pequop Series***

*Elevation:* 5,300 to 5,800 feet  
*Precipitation:* About 14 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

#### ***Dominant Present Vegetation***

Bregar: Bluegrass, low sagebrush  
 Ninemile: Bluegrass, bottlebrush squirreltail, low sagebrush  
 Pequop: Idaho fescue, bluegrass, mountain big sagebrush  
 Inclusion 1: None  
 Inclusion 2: Big sagebrush, cheatgrass  
 Inclusion 3: Basin big sagebrush, basin wildrye, bluegrass  
 Inclusion 4: Idaho fescue, antelope bitterbrush, mountain big sagebrush

#### ***Ecological Site***

Bregar: 025XY051NV  
 Ninemile: 025XY017NV  
 Pequop: 025XY012NV  
 Inclusion 1: None  
 Inclusion 2: 025XY009NV  
 Inclusion 3: 025XY003NV  
 Inclusion 4: 025XY007NV

### **1803--Bregar-Sumine-Rock outcrop association**

#### ***Composition***

##### ***Major Components***

Bregar very gravelly sandy loam, eroded, 15 to 50 percent slopes--45 percent

Sumine very gravelly loam, 30 to 50 percent slopes--25 percent

Rock outcrop--15 percent

#### **Contrasting Inclusions**

Inclusion 1: Pernty very gravelly loam, 30 to 50 percent slopes--10 percent

Inclusion 2: Chen very gravelly loam, 4 to 15 percent slopes--5 percent

#### **Map Unit Setting**

*Landscape position:* Hills

Bregar--Landform: Hills; geomorphic position: summit; shape of slope: convex

Sumine--Landform: Hills; geomorphic position:

backslope; shape of slope: plane; aspect: south

Rock outcrop--Landform: Hills; geomorphic position:

backslope; position on slope: upper; shape of slope: convex

Inclusion 1--Landform: Hills; geomorphic position:

backslope; shape of slope: plane; aspect: north

Inclusion 2--Landform: Hills; geomorphic position: summit

#### **Major Component Description**

##### **Bregar Series**

*Elevation:* 5,400 to 6,600 feet

*Precipitation:* About 13 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Very gravelly sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

##### **Sumine Series**

*Elevation:* 5,400 to 6,600 feet

*Precipitation:* About 12 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Very gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

##### **Rock outcrop Miscellaneous Area**

*Elevation:* 5,400 to 6,600 feet

*Drainage class:* Excessively drained

#### **Dominant Present Vegetation**

Bregar: Bluegrass, low sagebrush

Sumine: Antelope bitterbrush, bluebunch wheatgrass, cheatgrass, mountain big sagebrush

Rock outcrop: None

Inclusion 1: Idaho fescue, antelope bitterbrush

Inclusion 2: Bluegrass, low sagebrush

#### **Ecological Site**

Bregar: 025XY051NV

Sumine: 025XY009NV

Rock outcrop: None

Inclusion 1: 025XY012NV

Inclusion 2: 025XY017NV

### **1805--Bregar-Deseed-Linkup association**

#### **Composition**

##### **Major Components**

Bregar extremely cobbly loam, 15 to 30 percent slopes--35 percent

Deseed gravelly loam, 8 to 15 percent slopes--25 percent

Linkup very cobbly loam, 8 to 15 percent slopes--25 percent

##### **Contrasting Inclusions**

Inclusion 1: Lithic Xerollic Haplargids, loamy, mixed, frigid very gravelly loam, 4 to 15 percent slopes--7 percent

Inclusion 2: Xerollic Durargids, clayey, montmorillonitic, frigid, shallow gravelly loam, 4 to 15 percent slopes--3 percent

Inclusion 3: Rock outcrop--3 percent

Inclusion 4: Ratsow loam, 4 to 15 percent slopes--2 percent

#### **Map Unit Setting**

*Landscape position:* Hills

Bregar--Landform: Hills; geomorphic position: summit

Deseed--Landform: Hills; geomorphic position:

backslope; shape of slope: convex; aspect: north

Linkup--Landform: Hills; geomorphic position:

backslope; shape of slope: plane

Inclusion 1--Landform: Hills; geomorphic position: summit

Inclusion 2--Landform: Hills; geomorphic position: footslope

Inclusion 3--Landform: Hills; geomorphic position:

backslope; position on slope: upper; shape of slope: convex

Inclusion 4--Landform: Hills; geomorphic position: summit

#### **Major Component Description**

##### **Bregar Series**

*Elevation:* 5,500 to 6,500 feet

*Precipitation:* About 13 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Extremely cobbly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

##### **Deseed Series**

*Elevation:* 5,500 to 6,500 feet

*Precipitation:* About 11 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from volcanic rocks



**Linkup Series***Elevation:* 5,500 to 6,500 feet*Precipitation:* About 11 inches*Air temperature:* About 44 degrees*Frost-free season:* About 85 days*Surface layer texture:* Very cobbly loam*Drainage class:* Well drained*Dominant parent material:* Residuum and colluvium derived from volcanic rocks***Dominant Present Vegetation***

Bregar: Bluegrass, low sagebrush, rabbitbrush

Deseed: Big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Linkup: Bluegrass, bottlebrush squirreltail, low sagebrush

Inclusion 1: Big sagebrush, bluegrass, cheatgrass

Inclusion 2: Bluegrass, low sagebrush

Inclusion 3: None

Inclusion 4: Big sagebrush, bluegrass, cheatgrass

***Ecological Site***

Bregar: 025XY022NV

Deseed: 025XY014NV

Linkup: 025XY018NV

Inclusion 1: 025XY014NV

Inclusion 2: 025XY018NV

Inclusion 3: None

Inclusion 4: 025XY014NV

**1810--Shively-Ninemile-Hackwood association*****Composition******Major Components***

Shively loam, 30 to 50 percent slopes--35 percent

Ninemile very cobbly loam, 4 to 15 percent slopes--30 percent

Hackwood silt loam, 15 to 30 percent slopes--20 percent

***Contrasting Inclusions***

Inclusion 1: Rock outcrop--10 percent

Inclusion 2: Tusk loam, 15 to 30 percent slopes--3 percent

Inclusion 3: Pachic Cryoborolls, fine-loamy, mixed very gravelly loam--1 percent

Inclusion 4: Rubble land fragmental material--1 percent

***Map Unit Setting****Landscape position:* Mountains

Shively--Landform: Mountains; geomorphic position: backslope; aspect: north

Ninemile--Landform: Mountains; geomorphic position: summit

Hackwood--Landform: Mountains; geomorphic position: backslope; aspect: north

Inclusion 1--Landform: Mountains; geomorphic position: summit

Inclusion 2--Landform: Mountains; geomorphic position: backslope; aspect: north

Inclusion 3--Landform: Mountains; geomorphic position: backslope; aspect: north

Inclusion 4--Landform: Mountains; geomorphic position: backslope

***Major Component Description*****Shively Series***Elevation:* 6,500 to 7,500 feet*Precipitation:* About 16 inches*Air temperature:* About 44 degrees*Frost-free season:* About 85 days*Surface rock fragments:* 2 percent cobbles;*Surface layer texture:* Loam*Drainage class:* Well drained*Dominant parent material:* Residuum and colluvium derived from tuffaceous rocks**Ninemile Series***Elevation:* 6,500 to 7,500 feet*Precipitation:* About 14 inches*Air temperature:* About 44 degrees*Frost-free season:* About 85 days*Surface layer texture:* Very cobbly loam*Drainage class:* Well drained*Dominant parent material:* Residuum derived from volcanic rocks**Hackwood Series***Elevation:* 6,500 to 7,500 feet*Precipitation:* About 18 inches*Air temperature:* About 42 degrees*Frost-free season:* About 60 days*Surface layer texture:* Silt loam*Drainage class:* Well drained*Dominant parent material:* Colluvium derived from mixed rocks***Dominant Present Vegetation***

Shively: Idaho fescue, basin wildrye, bluebunch wheatgrass, snowberry

Ninemile: Bluegrass, bottlebrush squirreltail, low sagebrush

Hackwood: Mountain brome, quaking aspen, slender wheatgrass

Inclusion 1: None

Inclusion 2: Mountain big sagebrush, snowberry

Inclusion 3: Mountain brome, quaking aspen, slender wheatgrass

Inclusion 4: None

***Ecological Site***

Shively: 025XY010NV

Ninemile: 025XY017NV

Hackwood: 025XY065NV

Inclusion 1: None

Inclusion 2: 025XY004NV

Inclusion 3: 025XY002NV

Inclusion 4: None

**1830--Vanwyper, steep-Alyan-Vanwyper association****Composition****Major Components**

Vanwyper gravelly loam, 15 to 50 percent slopes--50 percent

Alyan gravelly loam, 15 to 50 percent slopes--20 percent

Vanwyper gravelly loam, 2 to 8 percent slopes--20 percent

**Contrasting Inclusions**

Inclusion 1: Lithic Argixerolls, clayey-skeletal, montmorillonitic, mesic very gravelly loam--6 percent

Inclusion 2: Aridic Argixerolls, fine, montmorillonitic, mesic gravelly loam, 2 to 8 percent slopes--2 percent

Inclusion 3: Xerollic Haplargids, clayey-skeletal, montmorillonitic, mesic gravelly loam, 30 to 50 percent slopes--2 percent

**Map Unit Setting**

*Landscape position:* Hills

Vanwyper--Landform: Hills; geomorphic position: backslope

Alyan--Landform: Hills; geomorphic position: backslope; aspect: north

Vanwyper--Landform: Hills; geomorphic position: summit

Inclusion 1--Landform: Hills; geomorphic position: summit

Inclusion 2--Landform: Drainageways

Inclusion 3--Landform: Hills; geomorphic position: backslope; aspect: south

**Major Component Description****Vanwyper Series**

*Elevation:* 5,500 to 6,500 feet

*Precipitation:* About 10 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

**Alyan Series**

*Elevation:* 5,500 to 6,500 feet

*Precipitation:* About 12 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

**Vanwyper Series**

*Elevation:* 5,500 to 6,500 feet

*Precipitation:* About 10 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

**Dominant Present Vegetation**

Vanwyper: Wyoming big sagebrush, bluegrass

Alyan: Bluegrass, mountain big sagebrush

Vanwyper: Wyoming big sagebrush, bluegrass

Inclusion 1: Bluegrass, low sagebrush

Inclusion 2: Basin big sagebrush, basin wildrye, bluegrass

Inclusion 3: Big sagebrush, bluebunch wheatgrass, cheatgrass

**Ecological Site**

Vanwyper: 025XY019NV

Alyan: 025XY014NV

Vanwyper: 025XY019NV

Inclusion 1: 025XY017NV

Inclusion 2: 025XY003NV

Inclusion 3: 025XY015NV

**1831--Vanwyper, moderately steep-Trunk-Vanwyper association****Composition****Major Components**

Vanwyper cobbly loam, 15 to 30 percent slopes--35 percent

Trunk gravelly loam, 30 to 50 percent slopes--30 percent

Vanwyper cobbly loam, 2 to 8 percent slopes--25 percent

**Contrasting Inclusions**

Inclusion 1: Lithic Haplargids, clayey-skeletal, montmorillonitic, mesic very gravelly loam--3 percent

Inclusion 2: Rubble land fragmental material--3 percent

Inclusion 3: Rock outcrop--2 percent

Inclusion 4: Xerollic Haplargids, clayey-skeletal, montmorillonitic, mesic gravelly loam, 4 to 15 percent slopes--2 percent

**Map Unit Setting**

*Landscape position:* Mountains

Vanwyper--Landform: Mountains; geomorphic position: backslope

Trunk--Landform: Mountains; geomorphic position: backslope

Vanwyper--Landform: Mountains; geomorphic position: summit

Inclusion 1--Landform: Mountains; geomorphic position: backslope

Inclusion 2--Landform: Mountains; geomorphic position: backslope

Inclusion 3--Landform: Mountains; geomorphic position: summit



Inclusion 4--Landform: Mountains; geomorphic position: footslope

### ***Major Component Description***

#### **Vanwyper Series**

*Elevation:* 5,400 to 6,200 feet

*Precipitation:* About 10 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Cobbly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from sedimentary rocks

#### **Trunk Series**

*Elevation:* 5,400 to 6,200 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from sedimentary rocks

#### **Vanwyper Series**

*Elevation:* 5,400 to 6,200 feet

*Precipitation:* About 10 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Cobbly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from sedimentary rocks

### ***Dominant Present Vegetation***

Vanwyper: Wyoming big sagebrush, bluegrass

Trunk: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Vanwyper: Wyoming big sagebrush, bluegrass

Inclusion 1: Bluegrass, low sagebrush

Inclusion 2: None

Inclusion 3: None

Inclusion 4: Wyoming big sagebrush, bottlebrush squirreltail, cheatgrass

### ***Ecological Site***

Vanwyper: 025XY019NV

Trunk: 025XY019NV

Vanwyper: 025XY019NV

Inclusion 1: 025XY017NV

Inclusion 2: None

Inclusion 3: None

Inclusion 4: 025XY019NV

## **1832--Vanwyper-Trunk-Trunk, steep association**

### ***Composition***

#### ***Major Components***

Vanwyper very cobbly loam, 15 to 50 percent slopes--35 percent

Trunk cobbly clay loam, 4 to 15 percent slopes--25 percent

Trunk cobbly clay loam, 15 to 50 percent slopes--25 percent

#### ***Contrasting Inclusions***

Inclusion 1: Rock outcrop--6 percent

Inclusion 2: Aridic Haploxerolls cobbly loam--3 percent

Inclusion 3: Xerollic Camborthids cobbly loam--3 percent

Inclusion 4: Typic Durorthids cobbly loam--3 percent

### ***Map Unit Setting***

*Landscape position:* Mountains

Vanwyper--Landform: Mountains; geomorphic position: backslope; aspect: south

Trunk--Landform: Mountains; geomorphic position: summit

Trunk--Landform: Mountains; geomorphic position: backslope

Inclusion 1--Landform: Mountains; geomorphic position: summit

Inclusion 2--Landform: Drainageways

Inclusion 3--Landform: Drainageways

Inclusion 4--Landform: Mountains; geomorphic position: footslope

### ***Major Component Description***

#### **Vanwyper Series**

*Elevation:* 5,400 to 6,000 feet

*Precipitation:* About 10 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Very cobbly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from sedimentary rocks

#### **Trunk Series**

*Elevation:* 5,400 to 6,000 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Cobbly clay loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from mixed rocks

#### **Trunk Series**

*Elevation:* 5,400 to 6,000 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Cobbly clay loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from mixed rocks

### ***Dominant Present Vegetation***

Vanwyper: Wyoming big sagebrush  
Trunk: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass  
Trunk: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass  
Inclusion 1: None  
Inclusion 2: Bluegrass, mountain big sagebrush  
Inclusion 3: Basin big sagebrush, basin wildrye  
Inclusion 4: Cheatgrass, shadscale

### ***Ecological Site***

Vanwyper: 025XY015NV  
Trunk: 025XY019NV  
Trunk: 025XY019NV  
Inclusion 1: None  
Inclusion 2: 025XY012NV  
Inclusion 3: 025XY031NV  
Inclusion 4: 024XY002NV

## **1833--Vanwyper-Rock outcrop-Trunk association**

### ***Composition***

#### ***Major Components***

Vanwyper very cobbly loam, 30 to 50 percent slopes--35 percent  
Rock outcrop--30 percent  
Trunk cobbly loam, 4 to 15 percent slopes--20 percent  
**Contrasting Inclusions**  
Inclusion 1: Aridic Haploxerolls cobbly loam--5 percent  
Inclusion 2: Xerollic Camborthids gravelly loam--5 percent  
Inclusion 3: Rubble land fragmental material--5 percent

### ***Map Unit Setting***

*Landscape position:* Hills  
Vanwyper--Landform: Hills; geomorphic position: backslope; aspect: south  
Rock outcrop--Landform: Hills; geomorphic position: summit  
Trunk--Landform: Hills; geomorphic position: summit  
Inclusion 1--Landform: Hills; geomorphic position: backslope; aspect: north  
Inclusion 2--Landform: Drainageways  
Inclusion 3--Landform: Hills; geomorphic position: backslope

### ***Major Component Description***

#### ***Vanwyper Series***

*Elevation:* 5,200 to 6,400 feet  
*Precipitation:* About 10 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Very cobbly loam  
*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

### ***Rock outcrop Miscellaneous Area***

*Elevation:* 5,200 to 6,400 feet  
*Drainage class:* Excessively drained  
**Trunk Series**  
*Elevation:* 5,200 to 6,400 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Cobbly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

### ***Dominant Present Vegetation***

Vanwyper: Big sagebrush, bluebunch wheatgrass, cheatgrass  
Rock outcrop: None  
Trunk: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass  
Inclusion 1: Bluegrass, mountain big sagebrush  
Inclusion 2: Basin big sagebrush, basin wildrye, bluegrass  
Inclusion 3: None

### ***Ecological Site***

Vanwyper: 025XY015NV  
Trunk: 025XY019NV  
Rock outcrop: None  
Inclusion 1: 025XY012NV  
Inclusion 2: 025XY003NV  
Inclusion 3: None

## **1852--Gumble-Tuffo-Hunnton association**

### ***Composition***

#### ***Major Components***

Gumble fine sandy loam, 4 to 15 percent slopes--40 percent  
Tuffo fine sandy loam, 4 to 15 percent slopes--30 percent  
Hunnton silt loam, 2 to 8 percent slopes--25 percent  
**Contrasting Inclusions**  
Inclusion 1: Xeric Torriorthents, loamy, mixed, nonacid, mesic, shallow gravelly loam, 8 to 15 percent slopes--3 percent  
Inclusion 2: Gumble very gravelly sandy loam, 30 to 50 percent slopes--2 percent

### ***Map Unit Setting***

*Landscape position:* Intermontane basins  
Gumble--Landform: Fan remnants; geomorphic position: backslope  
Tuffo--Landform: Fan remnants; geomorphic position: backslope  
Hunnton--Landform: Fan remnants; geomorphic position: summit  
Inclusion 1--Landform: Fan remnants



Inclusion 2--Landform: Fan remnants; geomorphic position: backslope; aspect: south

### ***Major Component Description***

#### **Gumble Series**

*Elevation:* 5,200 to 5,600 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum derived from tuffaceous rocks

#### **Tuffo Series**

*Elevation:* 5,200 to 5,600 feet  
*Precipitation:* About 10 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Fine sandy loam  
*Drainage class:* Somewhat excessively drained  
*Dominant parent material:* Residuum derived from tuffaceous rocks

#### **Hunnton Series**

*Elevation:* 5,200 to 5,600 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Silt loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

### ***Dominant Present Vegetation***

Gumble: Thurber needlegrass, Wyoming big sagebrush, bluebunch wheatgrass  
 Tuffo: Thurber needlegrass, Wyoming big sagebrush, bluebunch wheatgrass  
 Hunnton: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass  
 Inclusion 1: Indian ricegrass, Wyoming big sagebrush  
 Inclusion 2: Wyoming big sagebrush, bottlebrush squirreltail, cheatgrass

### ***Ecological Site***

Gumble: 025XY019NV  
 Tuffo: 025XY019NV  
 Hunnton: 025XY019NV  
 Inclusion 1: 025XY019NV  
 Inclusion 2: 025XY015NV

## **1853--Gumble-Tuffo-Rock outcrop association**

### ***Composition***

#### ***Major Components***

Gumble very gravelly sandy loam, 30 to 50 percent slopes--50 percent

Tuffo gravelly sandy loam, 30 to 50 percent slopes--25 percent

Rock outcrop--15 percent

#### **Contrasting Inclusions**

Inclusion 1: Hunnton silt loam, 2 to 8 percent slopes--5 percent

Inclusion 2: Durargidic Argixerolls, fine-loamy, mixed, mesic gravelly loam, 15 to 30 percent slopes--3 percent

Inclusion 3: Tuffo fine sandy loam, 8 to 15 percent slopes--2 percent

### ***Map Unit Setting***

*Landscape position:* Intermontane basins

Gumble--Landform: Fan remnants; geomorphic position: backslope; aspect: south

Tuffo--Landform: Fan remnants; geomorphic position: backslope

Rock outcrop--Landform: Fan remnants; geomorphic position: backslope

Inclusion 1--Landform: Fan remnants; geomorphic position: summit

Inclusion 2--Landform: Fan remnants; geomorphic position: footslope; aspect: north

Inclusion 3--Landform: Fan remnants; geomorphic position: shoulder; aspect: north

### ***Major Component Description***

#### **Gumble Series**

*Elevation:* 5,200 to 5,600 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Very gravelly sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum derived from tuffaceous rocks

#### **Tuffo Series**

*Elevation:* 5,200 to 5,600 feet  
*Precipitation:* About 10 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Gravelly sandy loam  
*Drainage class:* Somewhat excessively drained  
*Dominant parent material:* Residuum derived from tuffaceous rocks

#### **Rock outcrop Miscellaneous Area**

*Elevation:* 5,200 to 5,600 feet  
*Drainage class:* Excessively drained

### ***Dominant Present Vegetation***

Gumble: Wyoming big sagebrush, bluebunch wheatgrass, cheatgrass

Tuffo: Thurber needlegrass, Wyoming big sagebrush, bluebunch wheatgrass

Rock outcrop: None

Inclusion 1: Wyoming big sagebrush, bottlebrush squirreltail

Inclusion 2: Idaho fescue, basin big sagebrush

Inclusion 3: Wyoming big sagebrush, bottlebrush squirreltail

### ***Ecological Site***

Gumble: 025XY015NV

Tuffo: 025XY015NV

Rock outcrop: None

Inclusion 1: 025XY019NV

Inclusion 2: 025XY027NV

Inclusion 3: 025XY019NV

## **1854--Gumble-Chen association**

### ***Composition***

#### ***Major Components***

Gumble very gravelly sandy loam, 30 to 50 percent slopes--45 percent

Chen very gravelly loam, 4 to 15 percent slopes--40 percent

#### ***Contrasting Inclusions***

Inclusion 1: Quarz very gravelly loam, 30 to 50 percent slopes--6 percent

Inclusion 2: Wieland very gravelly loam, 2 to 8 percent slopes--5 percent

Inclusion 3: Welch silt loam, drained, 2 to 4 percent slopes, rarely flooded--3 percent

Inclusion 4: Xerollic Camborthids, coarse-loamy, mixed, frigid gravelly loam, 4 to 15 percent slopes--1 percent

### ***Map Unit Setting***

*Landscape position:* Hills

Gumble--Landform: Hills; geomorphic position: backslope; aspect: south

Chen--Landform: Hills; geomorphic position: summit; aspect: north

Inclusion 1--Landform: Hills; geomorphic position: backslope; aspect: south

Inclusion 2--Landform: Fan remnants; geomorphic position: summit

Inclusion 3--Landform: Drainageways

Inclusion 4--Landform: Fan remnants; geomorphic position: summit

### ***Major Component Description***

#### ***Gumble Series***

*Elevation:* 5,800 to 6,200 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Very gravelly sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from tuffaceous rocks

#### ***Chen Series***

*Elevation:* 5,800 to 6,200 feet

*Precipitation:* About 12 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Very gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

### ***Dominant Present Vegetation***

Gumble: Big sagebrush, bluebunch wheatgrass, cheatgrass

Chen: Bluegrass, bottlebrush squirreltail, low sagebrush

Inclusion 1: Big sagebrush, bluebunch wheatgrass, cheatgrass

Inclusion 2: Wyoming big sagebrush, bottlebrush squirreltail, cheatgrass

Inclusion 3: Basin big sagebrush, basin wildrye

Inclusion 4: Indian ricegrass, big sagebrush, needleandthread, rabbitbrush

### ***Ecological Site***

Gumble: 025XY015NV

Chen: 025XY017NV

Inclusion 1: 025XY009NV

Inclusion 2: 025XY019NV

Inclusion 3: 025XY003NV

Inclusion 4: 024XY017NV

## **1855--Gumble-Puett variant-Xeric Torriorthents association**

### ***Composition***

#### ***Major Components***

Gumble gravelly sandy loam, 30 to 50 percent slopes--55 percent

Puett Variant gravelly loam, 30 to 50 percent slopes--15 percent

Xeric Torriorthents gravelly fine sandy loam, 15 to 30 percent slopes--15 percent

#### ***Contrasting Inclusions***

Inclusion 1: Vanwyper gravelly loam, 8 to 15 percent slopes--10 percent

Inclusion 2: Typic Haplargids, fine, montmorillonitic, mesic very gravelly loam, 30 to 50 percent slopes--4 percent

Inclusion 3: Xeric Torriorthents, loamy-skeletal, mixed, nonacid, mesic gravelly loam, 0 to 4 percent slopes--1 percent

### ***Map Unit Setting***

*Landscape position:* Hills

Gumble--Landform: Hills; geomorphic position: backslope; aspect: south

Puett Variant--Landform: Hills; geomorphic position: backslope; shape of slope: convex

Xeric Torriorthents--Landform: Hills; geomorphic position: backslope; shape of slope: convex

Inclusion 1--Landform: Hills; geomorphic position: summit

Inclusion 2--Landform: Hills; geomorphic position: backslope

Inclusion 3--Landform: Drainageways



**Major Component Description****Gumble Series***Elevation:* 4,500 to 5,500 feet*Precipitation:* About 9 inches*Air temperature:* About 47 degrees*Frost-free season:* About 110 days*Surface layer texture:* Gravelly sandy loam*Drainage class:* Well drained*Dominant parent material:* Residuum derived from tuffaceous rocks**Puett Variant Variant***Elevation:* 4,500 to 5,500 feet*Precipitation:* About 9 inches*Air temperature:* About 47 degrees*Frost-free season:* About 110 days*Surface layer texture:* Gravelly loam*Drainage class:* Well drained*Dominant parent material:* Residuum and colluvium derived from tuffaceous rocks**Xeric Torriorthents Soils***Elevation:* 4,500 to 5,500 feet*Precipitation:* About 9 inches*Air temperature:* About 47 degrees*Frost-free season:* About 110 days*Surface rock fragments:* 3 percent cobbles; 40 percent gravel*Surface layer texture:* Gravelly fine sandy loam*Drainage class:* Well drained*Dominant parent material:* Residuum derived from tuffaceous rocks**Dominant Present Vegetation**

Gumble: Big sagebrush, bluebunch wheatgrass

Puett Variant: Cheatgrass, shadscale

Xeric Torriorthents: Wyoming big sagebrush, cheatgrass, shadscale

Inclusion 1: Wyoming big sagebrush, bottlebrush squirreltail, cheatgrass

Inclusion 2: Bottlebrush squirreltail, rabbitbrush, shadscale

Inclusion 3: Wyoming big sagebrush, bottlebrush squirreltail

**Ecological Site**

Gumble: 025XY015NV

Puett Variant: 024XY002NV

Xeric Torriorthents: 024XY020NV

Inclusion 1: 025XY019NV

Inclusion 2: 024XY025NV

Inclusion 3: 025XY019NV

**1870--Chen-Graley-Quarz association****Composition****Major Components**

Chen very gravelly loam, 15 to 50 percent slopes--40 percent

Graley very gravelly loam, 15 to 50 percent slopes--30 percent

Quarz very gravelly loam, 30 to 50 percent slopes--15 percent

**Contrasting Inclusions**

Inclusion 1: Arcia silty clay loam, 15 to 50 percent slopes--8 percent

Inclusion 2: Graley very stony loam, 4 to 15 percent slopes--5 percent

Inclusion 3: Rock outcrop--1 percent

Inclusion 4: Hapgood very gravelly loam, 15 to 50 percent slopes--1 percent

**Map Unit Setting***Landscape position:* Hills

Chen--Landform: Hills; geomorphic position: summit; shape of slope: convex

Graley--Landform: Hills; geomorphic position:

backslope; shape of slope: convex; aspect: north

Quarz--Landform: Hills; geomorphic position:

backslope; aspect: south

Inclusion 1--Landform: Hills; geomorphic position:

backslope; shape of slope: concave; aspect: north

Inclusion 2--Landform: Hills; geomorphic position: summit

Inclusion 3--Landform: Hills; geomorphic position: summit

Inclusion 4--Landform: Hills; geomorphic position: backslope; shape of slope: concave; aspect: north

**Major Component Description****Chen Series***Elevation:* 6,200 to 6,600 feet*Precipitation:* About 12 inches*Air temperature:* About 44 degrees*Frost-free season:* About 85 days*Surface layer texture:* Very gravelly loam*Drainage class:* Well drained*Dominant parent material:* Residuum and colluvium derived from volcanic rocks**Graley Series***Elevation:* 6,200 to 6,600 feet*Precipitation:* About 14 inches*Air temperature:* About 44 degrees*Frost-free season:* About 85 days*Surface layer texture:* Very gravelly loam*Drainage class:* Well drained*Dominant parent material:* Residuum derived from volcanic rocks**Quarz Series***Elevation:* 6,200 to 6,600 feet*Precipitation:* About 12 inches*Air temperature:* About 44 degrees*Frost-free season:* About 85 days*Surface layer texture:* Very gravelly loam*Drainage class:* Well drained*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

***Dominant Present Vegetation***

Chen: Bluegrass, bottlebrush squirreltail, low sagebrush  
 Graley: Idaho fescue, antelope bitterbrush, bluebunch wheatgrass, mountain big sagebrush  
 Quarz: Antelope bitterbrush, basin wildrye, big sagebrush, bluebunch wheatgrass  
 Inclusion 1: Idaho fescue, antelope bitterbrush, mountain big sagebrush  
 Inclusion 2: Antelope bitterbrush, mountain big sagebrush  
 Inclusion 3: None  
 Inclusion 4: Mountain brome, snowberry

***Ecological Site***

Chen: 025XY017NV  
 Graley: 025XY012NV  
 Quarz: 025XY009NV  
 Inclusion 1: 025XY012NV  
 Inclusion 2: 025XY012NV  
 Inclusion 3: None  
 Inclusion 4: 025XY004NV

**1871--Chen-Cotant-Graley association*****Composition******Major Components***

Chen very gravelly loam, 4 to 15 percent slopes--40 percent  
 Cotant very gravelly loam, 4 to 15 percent slopes--35 percent  
 Graley very gravelly loam, 8 to 15 percent slopes--15 percent

***Contrasting Inclusions***

Inclusion 1: McIvey gravelly loam, 8 to 15 percent slopes--5 percent  
 Inclusion 2: Welch silt loam, 2 to 8 percent slopes, frequently flooded--3 percent  
 Inclusion 3: Rock outcrop--2 percent

***Map Unit Setting******Landscape position:*** Hills

Chen--Landform: Hills; geomorphic position: summit; shape of slope: convex  
 Cotant--Landform: Hills; geomorphic position: shoulder  
 Graley--Landform: Hills; geomorphic position: backslope; aspect: north  
 Inclusion 1--Landform: Hills; geomorphic position: backslope; aspect: north  
 Inclusion 2--Landform: Drainageways  
 Inclusion 3--Landform: Hills; geomorphic position: summit

***Major Component Description******Chen Series***

*Elevation:* 6,200 to 6,400 feet  
*Precipitation:* About 12 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Very gravelly loam  
*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from tuffaceous rocks

***Cotant Series***

*Elevation:* 6,200 to 6,400 feet  
*Precipitation:* About 14 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Very gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum derived from tuffaceous rocks

***Graley Series***

*Elevation:* 6,200 to 6,400 feet  
*Precipitation:* About 14 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Very gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum derived from tuffaceous rocks

***Dominant Present Vegetation***

Chen: Bluegrass, bottlebrush squirreltail, low sagebrush  
 Cotant: Bluegrass, bottlebrush squirreltail, low sagebrush  
 Graley: Idaho fescue, antelope bitterbrush, bluebunch wheatgrass, mountain big sagebrush  
 Inclusion 1: Idaho fescue, antelope bitterbrush, mountain big sagebrush  
 Inclusion 2: Rush, sedge, willow  
 Inclusion 3: None

***Ecological Site***

Chen: 025XY017NV  
 Cotant: 025XY017NV  
 Graley: 025XY012NV  
 Inclusion 1: 025XY012NV  
 Inclusion 2: 025XY005NV  
 Inclusion 3: None

**1872--Chen-Sumine-Tusel association*****Composition******Major Components***

Chen very gravelly loam, 30 to 50 percent slopes--40 percent  
 Sumine very gravelly loam, 30 to 50 percent slopes--30 percent  
 Tusel very gravelly loam, 30 to 50 percent slopes--15 percent

***Contrasting Inclusions***

Inclusion 1: Rock outcrop--6 percent  
 Inclusion 2: Cleavage extremely gravelly loam, 15 to 50 percent slopes--5 percent  
 Inclusion 3: Argic Pachic Cryoborolls, fine, montmorillonitic gravelly loam, 15 to 50 percent slopes--2 percent



Inclusion 4: Tusel gravelly loam, 30 to 75 percent slopes--2 percent

### **Map Unit Setting**

*Landscape position:* Mountains

Chen--Landform: Mountains; geomorphic position: backslope; shape of slope: convex

Sumine--Landform: Mountains; geomorphic position: backslope; aspect: south

Tusel--Landform: Mountains; geomorphic position: backslope; aspect: north

Inclusion 1--Landform: Mountains; geomorphic position: backslope

Inclusion 2--Landform: Mountains; geomorphic position: summit

Inclusion 3--Landform: Mountains; geomorphic position: footslope; shape of slope: concave; aspect: north

Inclusion 4--Landform: Mountains; geomorphic position: backslope; aspect: north

### **Major Component Description**

#### **Chen Series**

*Elevation:* 6,100 to 7,200 feet

*Precipitation:* About 12 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Very gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from tuffaceous rocks

#### **Sumine Series**

*Elevation:* 6,100 to 7,200 feet

*Precipitation:* About 12 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Very gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from tuffaceous rocks

#### **Tusel Series**

*Elevation:* 6,100 to 7,200 feet

*Precipitation:* About 18 inches

*Air temperature:* About 42 degrees

*Frost-free season:* About 60 days

*Surface layer texture:* Very gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from tuffaceous rocks

### **Dominant Present Vegetation**

Chen: Bluegrass, bottlebrush squirreltail, low sagebrush

Sumine: Antelope bitterbrush, bluebunch wheatgrass, cheatgrass, mountain big sagebrush

Tusel: Idaho fescue, mountain brome, slender wheatgrass, snowberry

Inclusion 1: None

Inclusion 2: Low sagebrush

Inclusion 3: Mountain brome, snowberry

Inclusion 4: Mountain big sagebrush

### **Ecological Site**

Chen: 025XY017NV

Sumine: 025XY009NV

Tusel: 025XY004NV

Inclusion 1: None

Inclusion 2: 025XY024NV

Inclusion 3: 025XY004NV

Inclusion 4: 025XY010NV

## **1874--Chen-Quarz-Arcia association**

### **Composition**

#### **Major Components**

Chen very gravelly loam, 15 to 50 percent slopes--35 percent

Quarz gravelly clay loam, 30 to 50 percent slopes--30 percent

Arcia silt loam, 30 to 50 percent slopes--20 percent

#### **Contrasting Inclusions**

Inclusion 1: Cleavage extremely gravelly loam, 15 to 50 percent slopes--5 percent

Inclusion 2: Bregar extremely gravelly loam, 15 to 30 percent slopes--4 percent

Inclusion 3: Rock outcrop--3 percent

Inclusion 4: Tusk gravelly loam, 15 to 50 percent slopes--3 percent

### **Map Unit Setting**

*Landscape position:* Mountains

Chen--Landform: Mountains; geomorphic position: backslope; shape of slope: convex

Quarz--Landform: Mountains; geomorphic position: backslope; aspect: south

Arcia--Landform: Mountains; geomorphic position: backslope; aspect: north

Inclusion 1--Landform: Mountains; geomorphic position: summit

Inclusion 2--Landform: Mountains; geomorphic position: shoulder

Inclusion 3--Landform: Mountains; geomorphic position: backslope

Inclusion 4--Landform: Mountains; geomorphic position: backslope; position on slope: upper; shape of slope: concave; aspect: north

### **Major Component Description**

#### **Chen Series**

*Elevation:* 5,600 to 6,400 feet

*Precipitation:* About 12 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Very gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from tuffaceous rocks

#### **Quarz Series**

*Elevation:* 5,600 to 6,400 feet

*Precipitation:* About 12 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Gravelly clay loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from tuffaceous rocks

#### **Arcia Series**

*Elevation:* 5,600 to 6,400 feet  
*Precipitation:* About 14 inches  
*Air temperature:* About 43 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Silt loam  
*Drainage class:* Well drained  
*Dominant parent material:* Colluvium derived from tuffaceous rocks

#### ***Dominant Present Vegetation***

Chen: Bluegrass, bottlebrush squirreltail, low sagebrush  
 Quarz: Antelope bitterbrush, basin wildrye, big sagebrush, bluebunch wheatgrass  
 Arcia: Idaho fescue, bluebunch wheatgrass, mountain big sagebrush  
 Inclusion 1: Low sagebrush  
 Inclusion 2: Low sagebrush  
 Inclusion 3: None  
 Inclusion 4: Mountain brome, snowberry

#### ***Ecological Site***

Chen: 025XY017NV  
 Quarz: 025XY009NV  
 Arcia: 025XY012NV  
 Inclusion 1: 025XY024NV  
 Inclusion 2: 025XY022NV  
 Inclusion 3: None  
 Inclusion 4: 025XY004NV

### **1875--Chen-Bregar-Ramires association**

#### ***Composition***

##### ***Major Components***

Chen very gravelly loam, 4 to 15 percent slopes--50 percent  
 Bregar extremely gravelly loam, 4 to 15 percent slopes--20 percent  
 Ramires clay loam, 4 to 15 percent slopes--15 percent  
**Contrasting Inclusions**  
 Inclusion 1: Ninemile very cobbly loam, 2 to 8 percent slopes--7 percent  
 Inclusion 2: Rock outcrop--3 percent  
 Inclusion 3: Alyan gravelly clay loam, 4 to 15 percent slopes--4 percent  
 Inclusion 4: Crooked Creek silty clay loam, 2 to 4 percent slopes, frequently flooded--1 percent

#### ***Map Unit Setting***

*Landscape position:* Hills  
 Chen--Landform: Hills; geomorphic position: summit  
 Bregar--Landform: Hills; geomorphic position: shoulder

Ramires--Landform: Hills; geomorphic position: toeslope; shape of slope: concave  
 Inclusion 1--Landform: Hills; geomorphic position: summit  
 Inclusion 2--Landform: Hills; geomorphic position: shoulder  
 Inclusion 3--Landform: Hills; geomorphic position: shoulder; aspect: north  
 Inclusion 4--Landform: Drainageways

#### ***Major Component Description***

##### **Chen Series**

*Elevation:* 5,400 to 6,200 feet  
*Precipitation:* About 12 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Very gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from tuffaceous rocks

##### **Bregar Series**

*Elevation:* 5,400 to 6,200 feet  
*Precipitation:* About 13 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Extremely gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from tuffaceous rocks

##### **Ramires Series**

*Elevation:* 5,400 to 6,200 feet  
*Precipitation:* About 11 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Clay loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum derived from tuffaceous rocks

#### ***Dominant Present Vegetation***

Chen: Bluegrass, bottlebrush squirreltail, low sagebrush  
 Bregar: Bluegrass, low sagebrush, rabbitbrush  
 Ramires: Basin wildrye, big sagebrush, bluebunch wheatgrass, rabbitbrush  
 Inclusion 1: Low sagebrush  
 Inclusion 2: None  
 Inclusion 3: Idaho fescue, basin big sagebrush  
 Inclusion 4: Rush, sedge

#### ***Ecological Site***

Chen: 025XY017NV  
 Bregar: 025XY022NV  
 Ramires: 025XY014NV  
 Inclusion 1: 025XY017NV  
 Inclusion 2: None  
 Inclusion 3: 025XY027NV  
 Inclusion 4: 025XY005NV



**1876--Chen-Chen, steep-Arcia association****Composition****Major Components**

Chen very gravelly loam, 4 to 15 percent slopes--55 percent  
 Chen very gravelly loam, 15 to 50 percent slopes--20 percent  
 Arcia silt loam, 15 to 30 percent slopes--15 percent

**Contrasting Inclusions**

Inclusion 1: Bregar extremely gravelly loam, 4 to 15 percent slopes--5 percent  
 Inclusion 2: Rock outcrop--3 percent  
 Inclusion 3: Crooked Creek silty clay loam, 0 to 2 percent slopes, frequently flooded--1 percent  
 Inclusion 4: Crooked Creek silty clay loam, drained, 0 to 2 percent slopes, rarely flooded--1 percent

**Map Unit Setting**

*Landscape position:* Hills

Chen--Landform: Hills; geomorphic position: summit; shape of slope: convex  
 Chen--Landform: Hills; geomorphic position: backslope; shape of slope: convex  
 Arcia--Landform: Hills; geomorphic position: backslope  
 Inclusion 1--Landform: Hills; geomorphic position: summit  
 Inclusion 2--Landform: Hills; geomorphic position: summit  
 Inclusion 3--Landform: Drainageways  
 Inclusion 4--Landform: Drainageways

**Major Component Description****Chen Series**

*Elevation:* 5,400 to 5,600 feet  
*Precipitation:* About 12 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Very gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

**Chen Series**

*Elevation:* 5,400 to 5,600 feet  
*Precipitation:* About 12 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Very gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

**Arcia Series**

*Elevation:* 5,400 to 5,600 feet  
*Precipitation:* About 14 inches  
*Air temperature:* About 43 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Silt loam  
*Drainage class:* Well drained

*Dominant parent material:* Colluvium derived from tuffaceous rocks

**Dominant Present Vegetation**

Chen: Bluegrass, bottlebrush squirreltail, low sagebrush  
 Chen: Bluegrass, low sagebrush  
 Arcia: Idaho fescue, bluebunch wheatgrass, mountain big sagebrush  
 Inclusion 1: Low sagebrush  
 Inclusion 2: None  
 Inclusion 3: Rush, sedge, willow  
 Inclusion 4: Basin big sagebrush, basin wildrye

**Ecological Site**

Chen: 025XY017NV  
 Chen: 025XY017NV  
 Arcia: 025XY012NV  
 Inclusion 1: 025XY022NV  
 Inclusion 2: None  
 Inclusion 3: 025XY005NV  
 Inclusion 4: 025XY003NV

**1877--Chen-Bregar-Loncan association****Composition****Major Components**

Chen very cobbly loam, 15 to 30 percent slopes--45 percent  
 Bregar very gravelly sandy loam, 4 to 15 percent slopes--25 percent  
 Loncan very gravelly loam, 15 to 30 percent slopes--15 percent

**Contrasting Inclusions**

Inclusion 1: Rock outcrop--9 percent  
 Inclusion 2: Fluvaquent Haploxerolls, fine-loamy, mixed, frigid silt loam--3 percent  
 Inclusion 3: Cleavage extremely gravelly loam, 8 to 15 percent slopes--3 percent

**Map Unit Setting**

*Landscape position:* Hills

Chen--Landform: Hills; geomorphic position: backslope; shape of slope: convex  
 Bregar--Landform: Hills; geomorphic position: summit  
 Loncan--Landform: Hills; geomorphic position: backslope; shape of slope: convex; aspect: north  
 Inclusion 1--Landform: Hills; geomorphic position: backslope  
 Inclusion 2--Landform: Drainageways  
 Inclusion 3--Landform: Hills; geomorphic position: summit

**Major Component Description****Chen Series**

*Elevation:* 6,200 to 7,100 feet  
*Precipitation:* About 12 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Very cobbly loam  
*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from tuffaceous rocks

#### **Bregar Series**

*Elevation:* 6,200 to 7,100 feet

*Precipitation:* About 13 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Very gravelly sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from tuffaceous rocks

#### **Loncan Series**

*Elevation:* 6,200 to 7,100 feet

*Precipitation:* About 14 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Very gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from tuffaceous rocks

#### ***Dominant Present Vegetation***

Chen: Bluegrass, bottlebrush squirreltail, low sagebrush

Bregar: Bottlebrush squirreltail, low sagebrush

Loncan: Idaho fescue, antelope bitterbrush, mountain big sagebrush

Inclusion 1: None

Inclusion 2: Rush, sedge, tufted hairgrass, willow

Inclusion 3: Bluegrass, low sagebrush

#### ***Ecological Site***

Chen: 025XY017NV

Bregar: 025XY051NV

Loncan: 025XY012NV

Inclusion 1: None

Inclusion 2: 025XY005NV

Inclusion 3: 025XY024NV

### **1880--Chen-Blitzen-Pequop association**

#### ***Composition***

##### ***Major Components***

Chen very gravelly loam, 15 to 50 percent slopes--40 percent

Blitzen very gravelly loam, 15 to 50 percent slopes--30 percent

Pequop gravelly loam, 15 to 50 percent slopes--25 percent

##### ***Contrasting Inclusions***

Inclusion 1: Rock outcrop--2 percent

Inclusion 2: Chen very gravelly loam, 4 to 15 percent slopes--2 percent

Inclusion 3: Welch silt loam, drained, 0 to 2 percent slopes, rarely flooded--1 percent

#### ***Map Unit Setting***

*Landscape position:* Mountains

Chen--Landform: Mountains; geomorphic position: summit; position on slope: upper; shape of slope: convex

Blitzen--Landform: Mountains; geomorphic position: backslope; aspect: south

Pequop--Landform: Mountains; geomorphic position: backslope; aspect: north

Inclusion 1--Landform: Mountains; geomorphic position: backslope

Inclusion 2--Landform: Mountains; geomorphic position: summit

Inclusion 3--Landform: Drainageways

#### ***Major Component Description***

##### **Chen Series**

*Elevation:* 6,000 to 6,200 feet

*Precipitation:* About 12 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Very gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

##### **Blitzen Series**

*Elevation:* 5,600 to 6,200 feet

*Precipitation:* About 13 inches

*Air temperature:* About 43 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Very gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from tuffaceous rocks

##### **Pequop Series**

*Elevation:* 5,600 to 6,200 feet

*Precipitation:* About 14 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

#### ***Dominant Present Vegetation***

Chen: Bluegrass, bottlebrush squirreltail, low sagebrush

Blitzen: Basin wildrye, bluebunch wheatgrass, mountain big sagebrush

Pequop: Idaho fescue, bluegrass, mountain big sagebrush

Inclusion 1: None

Inclusion 2: Bluegrass, low sagebrush

Inclusion 3: Basin big sagebrush, basin wildrye, bluegrass

#### ***Ecological Site***

Chen: 025XY017NV

Blitzen: 025XY009NV

Pequop: 025XY012NV

Inclusion 1: None

Inclusion 2: 025XY017NV



Inclusion 3: 025XY003NV

### 1881--Chen-Blitzen-Loncan association

#### *Composition*

##### **Major Components**

Chen very gravelly loam, 15 to 50 percent slopes--35 percent  
Blitzen gravelly clay loam, 15 to 50 percent slopes--30 percent  
Loncan very gravelly loam, 15 to 50 percent slopes--25 percent

##### **Contrasting Inclusions**

Inclusion 1: Rock outcrop--5 percent  
Inclusion 2: Shively loam, 30 to 50 percent slopes--3 percent  
Inclusion 3: Welch silt loam, drained, 2 to 8 percent slopes, rarely flooded--1 percent  
Inclusion 4: Welch silt loam, 0 to 2 percent slopes, occasionally flooded--1 percent

#### *Map Unit Setting*

*Landscape position:* Mountains and foothills  
Chen--Landform: Mountains; geomorphic position: summit; position on slope: upper; shape of slope: convex  
Blitzen--Landform: Mountains; geomorphic position: backslope; aspect: south  
Loncan--Landform: Mountains; geomorphic position: backslope; aspect: north  
Inclusion 1--Landform: Mountains; geomorphic position: backslope  
Inclusion 2--Landform: Mountains; geomorphic position: backslope; position on slope: upper; shape of slope: concave; aspect: north  
Inclusion 3--Landform: Drainageways  
Inclusion 4--Landform: Drainageways

#### *Major Component Description*

##### **Chen Series**

*Elevation:* 5,700 to 6,300 feet  
*Precipitation:* About 12 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Very gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

##### **Blitzen Series**

*Elevation:* 5,700 to 6,300 feet  
*Precipitation:* About 13 inches  
*Air temperature:* About 43 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Gravelly clay loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

##### **Loncan Series**

*Elevation:* 5,700 to 6,300 feet  
*Precipitation:* About 14 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Very gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from tuffaceous rocks

#### *Dominant Present Vegetation*

Chen: Low sagebrush  
Blitzen: Basin wildrye, bluebunch wheatgrass, mountain big sagebrush  
Loncan: Idaho fescue, antelope bitterbrush, mountain big sagebrush  
Inclusion 1: None  
Inclusion 2: Idaho fescue, mountain big sagebrush  
Inclusion 3: Basin big sagebrush, basin wildrye, bluegrass  
Inclusion 4: Nevada bluegrass, alpine timothy

#### *Ecological Site*

Chen: 025XY017NV  
Blitzen: 025XY009NV  
Loncan: 025XY012NV  
Inclusion 1: None  
Inclusion 2: 025XY010NV  
Inclusion 3: 025XY003NV  
Inclusion 4: 025XY006NV

### 1888--Chen-Pie Creek-Alyan association

#### *Composition*

##### **Major Components**

Chen cobbly loam, 15 to 30 percent slopes--40 percent  
Pie Creek very cobbly loam, 15 to 30 percent slopes--25 percent  
Alyan gravelly loam, 15 to 30 percent slopes--20 percent

##### **Contrasting Inclusions**

Inclusion 1: Aridic Calcic Argixerolls, fine, montmorillonitic, frigid gravelly loam--7 percent  
Inclusion 2: Rock outcrop--3 percent  
Inclusion 3: Welch silt loam, drained, 0 to 2 percent slopes, rarely flooded--3 percent  
Inclusion 4: Crooked Creek silty clay loam, 0 to 2 percent slopes, frequently flooded--2 percent

#### *Map Unit Setting*

*Landscape position:* Hills  
Chen--Landform: Hills; geomorphic position: summit  
Pie Creek--Landform: Hills; geomorphic position: toeslope  
Alyan--Landform: Hills; geomorphic position: backslope  
Inclusion 1--Landform: Hills; geomorphic position: backslope; aspect: south

Inclusion 2--Landform: Hills; geomorphic position: backslope

Inclusion 3--Landform: Drainageways

Inclusion 4--Landform: Drainageways

### ***Major Component Description***

#### **Chen Series**

*Elevation:* 5,500 to 6,500 feet

*Precipitation:* About 12 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Cobbly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

#### **Pie Creek Series**

*Elevation:* 5,500 to 6,500 feet

*Precipitation:* About 11 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Very cobbly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from tuffaceous rocks

#### **Alyan Series**

*Elevation:* 5,500 to 6,500 feet

*Precipitation:* About 12 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from tuffaceous rocks

### ***Dominant Present Vegetation***

Chen: Bluegrass, bottlebrush squirreltail, low sagebrush

Pie Creek: Bluegrass, bottlebrush squirreltail, low sagebrush

Alyan: Big sagebrush, bottlebrush squirreltail, cheatgrass

Inclusion 1: Big sagebrush, bottlebrush squirreltail, cheatgrass

Inclusion 2: None

Inclusion 3: Basin big sagebrush, basin wildrye, bluegrass

Inclusion 4: Rush, sedge, tufted hairgrass, willow

### ***Ecological Site***

Chen: 025XY017NV

Pie Creek: 025XY018NV

Alyan: 025XY014NV

Inclusion 1: 025XY014NV

Inclusion 2: None

Inclusion 3: 025XY003NV

Inclusion 4: 025XY005NV

## **1889--Chen-Sumine association**

### ***Composition***

#### ***Major Components***

Chen very gravelly loam, 15 to 50 percent slopes--60 percent

Sumine very gravelly loam, 15 to 50 percent slopes--25 percent

#### ***Contrasting Inclusions***

Inclusion 1: Arcia silty clay loam, 15 to 50 percent slopes--5 percent

Inclusion 2: Pachic Haploxerolls very gravelly loam, 15 to 50 percent slopes--4 percent

Inclusion 3: Rock outcrop--3 percent

Inclusion 4: Cleavage extremely gravelly loam--3 percent

### ***Map Unit Setting***

*Landscape position:* Mountains

Chen--Landform: Mountains; geomorphic position: summit; shape of slope: convex

Sumine--Landform: Mountains; geomorphic position: backslope; aspect: south

Inclusion 1--Landform: Mountains; geomorphic position: backslope; shape of slope: concave; aspect: north

Inclusion 2--Landform: Mountains; geomorphic position: backslope; shape of slope: concave; aspect: north

Inclusion 3--Landform: Mountains; geomorphic position: summit

Inclusion 4--Landform: Mountains; geomorphic position: summit; position on slope: upper part

### ***Major Component Description***

#### **Chen Series**

*Elevation:* 5,400 to 7,000 feet

*Precipitation:* About 12 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Very gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from tuffaceous rocks

#### **Sumine Series**

*Elevation:* 5,400 to 7,000 feet

*Precipitation:* About 12 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Very gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from tuffaceous rocks

### ***Dominant Present Vegetation***

Chen: Bluegrass, bottlebrush squirreltail, low sagebrush

Sumine: Antelope bitterbrush, bluebunch wheatgrass, cheatgrass, mountain big sagebrush

Inclusion 1: Bluebunch wheatgrass, mountain big sagebrush



Inclusion 2: Basin wildrye, mountain big sagebrush  
 Inclusion 3: None  
 Inclusion 4: Bluegrass, low sagebrush

### ***Ecological Site***

Chen: 025XY017NV  
 Sumine: 025XY009NV  
 Inclusion 1: 025XY012NV  
 Inclusion 2: 025XY029NV  
 Inclusion 3: None  
 Inclusion 4: 025XY024NV

## **1910--Mahala-Ramires association**

### ***Composition***

#### ***Major Components***

Mahala silt loam, 4 to 15 percent slopes--55 percent  
 Ramires clay loam, 4 to 15 percent slopes--30 percent

#### ***Contrasting Inclusions***

Inclusion 1: Aridic Durixerolls, fine, montmorillonitic, mesic gravelly loam--5 percent  
 Inclusion 2: Xerollic Durargids, clayey, montmorillonitic, mesic, shallow gravelly loam, 2 to 8 percent slopes--5 percent  
 Inclusion 3: Rock outcrop--5 percent

### ***Map Unit Setting***

*Landscape position:* Hills

Mahala--Landform: Hills; geomorphic position: summit; shape of slope: concave

Ramires--Landform: Hills; geomorphic position: summit; shape of slope: convex

Inclusion 1--Landform: Hills; geomorphic position: summit; shape of slope: concave

Inclusion 2--Landform: Hills; geomorphic position: summit; shape of slope: convex

Inclusion 3--Landform: Hills; geomorphic position: backslope

### ***Major Component Description***

#### ***Mahala Series***

*Elevation:* 5,400 to 5,800 feet

*Precipitation:* About 11 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Silt loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from tuffaceous rocks

#### ***Ramires Series***

*Elevation:* 5,400 to 5,600 feet

*Precipitation:* About 11 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Clay loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from tuffaceous rocks

### ***Dominant Present Vegetation***

Mahala: Bluegrass, bottlebrush squirreltail, low sagebrush

Ramires: Basin wildrye, big sagebrush, bluebunch wheatgrass, rabbitbrush

Inclusion 1: Big sagebrush, bottlebrush squirreltail, wheatgrass

Inclusion 2: Bluegrass, low sagebrush

Inclusion 3: None

### ***Ecological Site***

Mahala: 025XY018NV

Ramires: 025XY014NV

Inclusion 1: 025XY014NV

Inclusion 2: 025XY018NV

Inclusion 3: None

## **1920--Lerrow-Chen-Cotant association**

### ***Composition***

#### ***Major Components***

Lerrow cobbly loam, 15 to 50 percent slopes--40 percent

Chen very cobbly loam, 15 to 30 percent slopes--30 percent

Cotant cobbly loam, 15 to 30 percent slopes--15 percent

#### ***Contrasting Inclusions***

Inclusion 1: Sumine very gravelly loam, 15 to 50 percent slopes--5 percent

Inclusion 2: Typic Argixerolls, fine-loamy, mixed, frigid very gravelly loam, 15 to 30 percent slopes--4 percent

Inclusion 3: Tweener very cobbly sandy loam, 4 to 15 percent slopes--4 percent

Inclusion 4: Rock outcrop--2 percent

### ***Map Unit Setting***

*Landscape position:* Hills

Lerrow--Landform: Hills; geomorphic position:

backslope; shape of slope: convex; aspect: south

Chen--Landform: Hills; geomorphic position: backslope; position on slope: upper; shape of slope: convex

Cotant--Landform: Hills; geomorphic position: backslope; position on slope: lower; shape of slope: convex

Inclusion 1--Landform: Hills; geomorphic position: backslope; aspect: south

Inclusion 2--Landform: Hills; geomorphic position: backslope; shape of slope: concave; aspect: north

Inclusion 3--Landform: Hills; geomorphic position: summit; shape of slope: convex

Inclusion 4--Landform: Hills; geomorphic position: backslope

### ***Major Component Description***

#### ***Lerrow Series***

*Elevation:* 6,000 to 6,700 feet

*Precipitation:* About 14 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days  
*Surface layer texture:* Cobbly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from tuffaceous rocks

#### **Chen Series**

*Elevation:* 6,400 to 6,700 feet  
*Precipitation:* About 12 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Very cobbly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

#### **Cotant Series**

*Elevation:* 6,000 to 6,400 feet  
*Precipitation:* About 14 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Cobbly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum derived from tuffaceous rocks

#### ***Dominant Present Vegetation***

Lerrow: Basin wildrye, bluebunch wheatgrass, mountain big sagebrush  
 Chen: Bluegrass, bottlebrush squirreltail, low sagebrush  
 Cotant: Bluegrass, bottlebrush squirreltail, low sagebrush  
 Inclusion 1: Bluebunch wheatgrass, cheatgrass, mountain big sagebrush  
 Inclusion 2: Idaho fescue  
 Inclusion 3: Antelope bitterbrush, bluebunch wheatgrass  
 Inclusion 4: None

#### ***Ecological Site***

Lerrow: 025XY009NV  
 Chen: 025XY017NV  
 Cotant: 025XY017NV  
 Inclusion 1: 025XY009NV  
 Inclusion 2: 025XY027NV  
 Inclusion 3: 025XY007NV  
 Inclusion 4: None

### **1921--Lerrow-Quarz-Rugar association**

#### ***Composition***

#### ***Major Components***

Lerrow gravelly loam, 15 to 50 percent slopes--35 percent  
 Quarz very gravelly loam, 15 to 50 percent slopes--30 percent  
 Rugar loam, 15 to 30 percent slopes--20 percent

#### ***Contrasting Inclusions***

Inclusion 1: Chen very gravelly loam, 4 to 15 percent slopes--10 percent

Inclusion 2: Aridic Argixerolls, fine, montmorillonitic, frigid gravelly loam, 15 to 30 percent slopes--2 percent

Inclusion 3: Reluctant gravelly loam, 15 to 50 percent slopes--2 percent

Inclusion 4: Crooked Creek gravelly silty clay loam, 0 to 2 percent slopes--1 percent

#### ***Map Unit Setting***

*Landscape position:* Hills

Lerrow--Landform: Hills; geomorphic position: backslope; shape of slope: concave; aspect: north

Quarz--Landform: Hills; geomorphic position: backslope; aspect: south

Rugar--Landform: Hills; geomorphic position: footslope; aspect: north

Inclusion 1--Landform: Hills; geomorphic position: summit

Inclusion 2--Landform: Hills; geomorphic position: footslope

Inclusion 3--Landform: Hills; geomorphic position: backslope; shape of slope: concave; aspect: north

Inclusion 4--Landform: Drainageways

#### ***Major Component Description***

#### **Lerrow Series**

*Elevation:* 5,600 to 6,400 feet  
*Precipitation:* About 14 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from sedimentary rocks

#### **Quarz Series**

*Elevation:* 5,600 to 6,400 feet  
*Precipitation:* About 12 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface rock fragments:* 5 percent cobbles; 50 percent gravel  
*Surface layer texture:* Very gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from sedimentary rocks

#### **Rugar Series**

*Elevation:* 5,600 to 6,400 feet  
*Precipitation:* About 16 inches  
*Air temperature:* About 43 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum derived from sedimentary rocks

#### ***Dominant Present Vegetation***

Lerrow: Idaho fescue, Nevada bluegrass, big sagebrush, cheatgrass



Quarz: Antelope bitterbrush, basin wildrye, big sagebrush, wheatgrass  
 Rugar: Basin wildrye, bottlebrush squirreltail, mulesear wyethia, slender wheatgrass  
 Inclusion 1: Bluegrass, low sagebrush  
 Inclusion 2: Idaho fescue  
 Inclusion 3: Bluebunch wheatgrass, mountain big sagebrush  
 Inclusion 4: Nevada bluegrass, alpine timothy

#### ***Ecological Site***

Lerrow: 025XY027NV  
 Quarz: 025XY009NV  
 Rugar: 025XY047NV  
 Inclusion 1: 025XY017NV  
 Inclusion 2: 025XY027NV  
 Inclusion 3: 025XY012NV  
 Inclusion 4: 025XY006NV

### **1931--Tweener-Cleavage-Reluctan association**

#### ***Composition***

##### ***Major Components***

Tweener very cobbly sandy loam, 15 to 30 percent slopes--45 percent  
 Cleavage very gravelly loam, 15 to 30 percent slopes--25 percent  
 Reluctan cobbly loam, 15 to 50 percent slopes--25 percent

##### ***Contrasting Inclusions***

Inclusion 1: Welch silt loam, drained, 0 to 2 percent slopes, rarely flooded--3 percent  
 Inclusion 2: Gumble very gravelly sandy loam, 15 to 50 percent slopes--2 percent

#### ***Map Unit Setting***

*Landscape position:* Hills

Tweener--Landform: Hills; geomorphic position: backslope

Cleavage--Landform: Hills; geomorphic position: summit

Reluctan--Landform: Hills; geomorphic position: backslope; aspect: north

Inclusion 1--Landform: Drainageways

Inclusion 2--Landform: Hills; geomorphic position: backslope; aspect: south

#### ***Major Component Description***

##### ***Tweener Series***

*Elevation:* 5,600 to 6,000 feet  
*Precipitation:* About 14 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Very cobbly sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

##### ***Cleavage Series***

*Elevation:* 5,600 to 6,000 feet  
*Precipitation:* About 14 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Very gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum derived from volcanic rocks

##### ***Reluctan Series***

*Elevation:* 5,600 to 6,000 feet  
*Precipitation:* About 12 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Cobbly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

#### ***Dominant Present Vegetation***

Tweener: Antelope bitterbrush, bluegrass, cheatgrass, mountain big sagebrush  
 Cleavage: Idaho fescue, bluegrass, bottlebrush squirreltail, low sagebrush  
 Reluctan: Bluegrass, bottlebrush squirreltail, mountain big sagebrush, rabbitbrush  
 Inclusion 1: Basin big sagebrush, basin wildrye, bluegrass  
 Inclusion 2: Big sagebrush, bluebunch wheatgrass, cheatgrass

#### ***Ecological Site***

Tweener: 025XY007NV  
 Cleavage: 025XY017NV  
 Reluctan: 025XY012NV  
 Inclusion 1: 025XY003NV  
 Inclusion 2: 025XY015NV

### **1932--Tweener-Sumine-Cleavage association**

#### ***Composition***

##### ***Major Components***

Tweener very gravelly sandy loam, 15 to 50 percent slopes--30 percent  
 Sumine very gravelly loam, 15 to 50 percent slopes--30 percent  
 Cleavage very gravelly loam, 15 to 50 percent slopes--25 percent

##### ***Contrasting Inclusions***

Inclusion 1: Hapgood very gravelly loam, 30 to 75 percent slopes--5 percent  
 Inclusion 2: Tusel gravelly loam, 50 to 75 percent slopes--5 percent  
 Inclusion 3: Welch silt loam, drained, 2 to 4 percent slopes, rarely flooded--3 percent  
 Inclusion 4: Welch silt loam, 0 to 2 percent slopes, occasionally flooded--2 percent

**Map Unit Setting**

*Landscape position:* Mountains and foothills  
*Tweener--Landform:* Mountains; geomorphic position: backslope; shape of slope: convex  
*Sumine--Landform:* Mountains; geomorphic position: backslope; aspect: south  
*Cleavage--Landform:* Mountains; geomorphic position: summit  
*Inclusion 1--Landform:* Mountains; geomorphic position: backslope; aspect: north  
*Inclusion 2--Landform:* Mountains; geomorphic position: backslope; aspect: north  
*Inclusion 3--Landform:* Drainageways  
*Inclusion 4--Landform:* Drainageways

**Major Component Description****Tweener Series**

*Elevation:* 6,300 to 7,500 feet  
*Precipitation:* About 14 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Very gravelly sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from tuffaceous rocks

**Sumine Series**

*Elevation:* 6,300 to 7,500 feet  
*Precipitation:* About 12 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Very gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from tuffaceous rocks

**Cleavage Series**

*Elevation:* 6,300 to 7,500 feet  
*Precipitation:* About 14 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Very gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum derived from tuffaceous rocks

**Dominant Present Vegetation**

*Tweener:* Antelope bitterbrush, bluegrass, cheatgrass, mountain big sagebrush  
*Sumine:* Antelope bitterbrush, bluebunch wheatgrass, cheatgrass, mountain big sagebrush  
*Cleavage:* Idaho fescue, bluegrass, bottlebrush squirreltail, low sagebrush  
*Inclusion 1:* Idaho fescue, mountain brome, snowberry  
*Inclusion 2:* Mountain big sagebrush  
*Inclusion 3:* Basin big sagebrush, basin wildrye  
*Inclusion 4:* Nevada bluegrass

**Ecological Site**

*Tweener:* 025XY007NV  
*Sumine:* 025XY009NV

*Cleavage:* 025XY017NV  
*Inclusion 1:* 025XY004NV  
*Inclusion 2:* 025XY010NV  
*Inclusion 3:* 025XY003NV  
*Inclusion 4:* 025XY006NV

**1933--Tweener-Pequop-Cleavage association****Composition****Major Components**

*Tweener* very cobbly sandy loam, 15 to 30 percent slopes--55 percent  
*Pequop* gravelly loam, 15 to 50 percent slopes--15 percent  
*Cleavage* very gravelly loam, 4 to 15 percent slopes--15 percent

**Contrasting Inclusions**

*Inclusion 1:* Gumble very gravelly sandy loam, 15 to 50 percent slopes--7 percent  
*Inclusion 2:* Typic Argixerolls, fine-loamy, mixed, frigid very gravelly loam, 4 to 15 percent slopes--6 percent  
*Inclusion 3:* Bregar very gravelly sandy loam, 4 to 15 percent slopes--1 percent  
*Inclusion 4:* Rock outcrop--1 percent

**Map Unit Setting**

*Landscape position:* Hills  
*Tweener--Landform:* Hills; geomorphic position: backslope; shape of slope: convex  
*Pequop--Landform:* Hills; geomorphic position: backslope; aspect: north  
*Cleavage--Landform:* Hills; geomorphic position: summit; shape of slope: convex  
*Inclusion 1--Landform:* Hills; geomorphic position: backslope; aspect: south  
*Inclusion 2--Landform:* Hills; geomorphic position: footslope  
*Inclusion 3--Landform:* Hills; geomorphic position: summit  
*Inclusion 4--Landform:* Hills; geomorphic position: summit

**Major Component Description****Tweener Series**

*Elevation:* 6,000 to 6,400 feet  
*Precipitation:* About 14 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Very cobbly sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from tuffaceous rocks

**Pequop Series**

*Elevation:* 6,000 to 6,400 feet  
*Precipitation:* About 14 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Gravelly loam



*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from tuffaceous rocks

#### **Cleavage Series**

*Elevation:* 6,000 to 6,400 feet

*Precipitation:* About 14 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Very gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from tuffaceous rocks

#### **Dominant Present Vegetation**

Tweener: Antelope bitterbrush, bluegrass, cheatgrass, mountain big sagebrush

Pequop: Idaho fescue, bluegrass, mountain big sagebrush

Cleavage: Idaho fescue, bluegrass, bottlebrush squirreltail, low sagebrush

Inclusion 1: Big sagebrush, bluebunch wheatgrass, cheatgrass

Inclusion 2: Idaho fescue, basin big sagebrush

Inclusion 3: Low sagebrush

Inclusion 4: None

#### **Ecological Site**

Tweener: 025XY007NV

Pequop: 025XY012NV

Cleavage: 025XY017NV

Inclusion 1: 025XY015NV

Inclusion 2: 025XY027NV

Inclusion 3: 025XY051NV

Inclusion 4: None

### **1950--McIvey-McIvey, very cobbly-Tusel association**

#### **Composition**

##### **Major Components**

McIvey gravelly silt loam, 15 to 30 percent slopes--35 percent

McIvey very cobbly silt loam, 15 to 50 percent slopes--35 percent

Tusel very gravelly loam, 30 to 50 percent slopes--15 percent

##### **Contrasting Inclusions**

Inclusion 1: Entic Cryumbrepts, loamy-skeletal, mixed very gravelly loam, 30 to 50 percent slopes--10 percent

Inclusion 2: Typic Argixerolls, clayey-skeletal, montmorillonitic, frigid very gravelly loam, 15 to 50 percent slopes--3 percent

Inclusion 3: Aridic Argixerolls, clayey-skeletal, montmorillonitic, frigid gravelly loam, 15 to 50 percent slopes--2 percent

#### **Map Unit Setting**

*Landscape position:* Hills

McIvey--Landform: Hills; geomorphic position: summit

McIvey--Landform: Hills; geomorphic position: summit

Tusel--Landform: Hills; geomorphic position: backslope; shape of slope: concave

Inclusion 1--Landform: Hills; geomorphic position: backslope; aspect: north

Inclusion 2--Landform: Hills; geomorphic position: backslope; aspect: south

Inclusion 3--Landform: Hills; geomorphic position: backslope

#### **Major Component Description**

##### **McIvey Series**

*Elevation:* 6,200 to 7,200 feet

*Precipitation:* About 15 inches

*Air temperature:* About 43 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Gravelly silt loam

*Drainage class:* Well drained

*Dominant parent material:* Colluvium derived from quartzite

##### **McIvey Series**

*Elevation:* 6,200 to 7,200 feet

*Precipitation:* About 15 inches

*Air temperature:* About 43 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Very cobbly silt loam

*Drainage class:* Well drained

*Dominant parent material:* Colluvium derived from quartzite

##### **Tusel Series**

*Elevation:* 6,200 to 7,200 feet

*Precipitation:* About 18 inches

*Air temperature:* About 42 degrees

*Frost-free season:* About 60 days

*Surface layer texture:* Very gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from quartzite

#### **Dominant Present Vegetation**

McIvey: Idaho fescue, big sagebrush, mountain brome, snowberry

McIvey: Idaho fescue, big sagebrush, mountain brome, snowberry

Tusel: Idaho fescue, mountain brome, slender wheatgrass, snowberry

Inclusion 1: Letterman needlegrass, quaking aspen

Inclusion 2: Basin big sagebrush, bluebunch wheatgrass

Inclusion 3: Antelope bitterbrush, bluebunch wheatgrass

#### **Ecological Site**

McIvey: 025XY004NV

McIvey: 025XY004NV

Tusel: 025XY004NV

Inclusion 1: 025XY002NV

Inclusion 2: 025XY009NV

Inclusion 3: 025XY007NV

## 1980--Thwoop-Trunk-Pequop association

### *Composition*

#### **Major Components**

Thwoop gravelly silt loam, 8 to 15 percent slopes--40 percent

Trunk gravelly loam, 8 to 15 percent slopes--25 percent

Pequop gravelly loam, 30 to 50 percent slopes--20 percent

#### **Contrasting Inclusions**

Inclusion 1: Rock outcrop--7 percent

Inclusion 2: Chen very gravelly loam, 4 to 15 percent slopes--5 percent

Inclusion 3: Bregar very gravelly loam, 4 to 15 percent slopes--2 percent

Inclusion 4: Welch silt loam, drained, 2 to 4 percent slopes, rarely flooded--1 percent

### *Map Unit Setting*

*Landscape position:* Mountains

Thwoop--Landform: Mountains; geomorphic position: summit; shape of slope: convex; aspect: south

Trunk--Landform: Mountains; geomorphic position: footslope; position on slope: lower; aspect: south

Pequop--Landform: Mountains; geomorphic position: backslope; aspect: north

Inclusion 1--Landform: Mountains; geomorphic position: summit

Inclusion 2--Landform: Mountains; geomorphic position: summit

Inclusion 3--Landform: Mountains; geomorphic position: shoulder; aspect: south

Inclusion 4--Landform: Drainageways

### *Major Component Description*

#### **Thwoop Series**

*Elevation:* 5,200 to 6,000 feet

*Precipitation:* About 11 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Gravelly silt loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

#### **Trunk Series**

*Elevation:* 5,200 to 6,000 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

#### **Pequop Series**

*Elevation:* 5,200 to 6,000 feet

*Precipitation:* About 14 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

### *Dominant Present Vegetation*

Thwoop: Thurber needlegrass, basin wildrye, big sagebrush, bluegrass

Trunk: Wyoming big sagebrush, bluegrass, cheatgrass

Pequop: Idaho fescue, bluegrass, mountain big sagebrush

Inclusion 1: None

Inclusion 2: Bluegrass, low sagebrush

Inclusion 3: Low sagebrush

Inclusion 4: Basin big sagebrush

### *Ecological Site*

Thwoop: 025XY014NV

Trunk: 025XY019NV

Pequop: 025XY012NV

Inclusion 1: None

Inclusion 2: 025XY017NV

Inclusion 3: 025XY018NV

Inclusion 4: 025XY003NV

## 2000--Alyan-Cotant-Akler association

### *Composition*

#### **Major Components**

Alyan cobbly loam, 15 to 50 percent slopes--40 percent

Cotant cobbly loam, 15 to 50 percent slopes--30 percent

Akler loam, 4 to 15 percent slopes--15 percent

#### **Contrasting Inclusions**

Inclusion 1: Pattani clay, 8 to 15 percent slopes--10 percent

Inclusion 2: Rock outcrop--3 percent

Inclusion 3: Welch silt loam, 2 to 4 percent slopes, frequently flooded--1 percent

Inclusion 4: Welch silt loam, drained, 2 to 4 percent slopes, rarely flooded--1 percent

### *Map Unit Setting*

*Landscape position:* Hills

Alyan--Landform: Hills; geomorphic position: backslope; shape of slope: concave; aspect: north

Cotant--Landform: Hills; geomorphic position: backslope

Akler--Landform: Hills; geomorphic position: toeslope

Inclusion 1--Landform: Hills; geomorphic position: summit

Inclusion 2--Landform: Hills; geomorphic position: summit

Inclusion 3--Landform: Drainageways

Inclusion 4--Landform: Drainageways



**Major Component Description****Alyan Series**

*Elevation:* 5,400 to 6,000 feet  
*Precipitation:* About 12 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Cobbly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from tuffaceous rocks

**Cotant Series**

*Elevation:* 5,400 to 6,000 feet  
*Precipitation:* About 14 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Cobbly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum derived from tuffaceous rocks

**Akler Series**

*Elevation:* 6,200 to 6,700 feet  
*Precipitation:* About 12 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum derived from tuffaceous rocks

**Dominant Present Vegetation**

Alyan: Idaho fescue, bluebunch wheatgrass, mountain big sagebrush  
 Cotant: Bluegrass, bottlebrush squirreltail, low sagebrush  
 Akler: Bluegrass, bottlebrush squirreltail, low sagebrush  
 Inclusion 1: Basin wildrye, big sagebrush, rabbitbrush  
 Inclusion 2: None  
 Inclusion 3: Rush, sedge, willow  
 Inclusion 4: Basin big sagebrush

**Ecological Site**

Alyan: 025XY012NV  
 Cotant: 025XY017NV  
 Akler: 025XY018NV  
 Inclusion 1: 025XY013NV  
 Inclusion 2: None  
 Inclusion 3: 025XY005NV  
 Inclusion 4: 025XY003NV

**2001--Alyan, steep-Bregar-Alyan association****Composition****Major Components**

Alyan gravelly loam, 30 to 50 percent slopes--35 percent  
 Bregar very gravelly loam, 30 to 50 percent slopes--30 percent

Alyan gravelly loam, 4 to 15 percent slopes--20 percent

**Contrasting Inclusions**

Inclusion 1: Rubble land fragmental material--7 percent  
 Inclusion 2: Shively loam, 30 to 50 percent slopes--4 percent  
 Inclusion 3: Cleavage extremely gravelly loam, 4 to 15 percent slopes--3 percent  
 Inclusion 4: Welch silt loam, drained, 0 to 2 percent slopes, rarely flooded--1 percent

**Map Unit Setting**

*Landscape position:* Mountains  
 Alyan--Landform: Mountains; geomorphic position: backslope; shape of slope: concave  
 Bregar--Landform: Mountains; geomorphic position: backslope; shape of slope: convex  
 Alyan--Landform: Mountains; geomorphic position: backslope; shape of slope: concave  
 Inclusion 1--Landform: Mountains; geomorphic position: backslope  
 Inclusion 2--Landform: Mountains; geomorphic position: backslope; aspect: north  
 Inclusion 3--Landform: Mountains; geomorphic position: summit  
 Inclusion 4--Landform: Drainageways

**Major Component Description****Alyan Series**

*Elevation:* 6,000 to 7,500 feet  
*Precipitation:* About 12 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from tuffaceous rocks

**Bregar Series**

*Elevation:* 6,000 to 7,550 feet  
*Precipitation:* About 13 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Very gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

**Alyan Series**

*Elevation:* 6,000 to 7,500 feet  
*Precipitation:* About 12 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from tuffaceous rocks

**Dominant Present Vegetation**

Alyan: Bluebunch wheatgrass, bottlebrush squirreltail, cheatgrass, mountain big sagebrush

Bregar: Bluegrass, low sagebrush  
 Alyan: Bluebunch wheatgrass, bottlebrush squirreltail,  
 cheatgrass, mountain big sagebrush  
 Inclusion 1: None  
 Inclusion 2: Idaho fescue, mountain big sagebrush  
 Inclusion 3: Bluegrass, low sagebrush  
 Inclusion 4: Basin big sagebrush

### ***Ecological Site***

Alyan: 025XY014NV  
 Bregar: 025XY018NV  
 Alyan: 025XY014NV  
 Inclusion 1: None  
 Inclusion 2: 025XY010NV  
 Inclusion 3: 025XY024NV  
 Inclusion 4: 025XY003NV

## **2002--Alyan, moderately steep-Alyan-Quarz association**

### ***Composition***

#### ***Major Components***

Alyan gravelly clay loam, 15 to 30 percent slopes--35 percent  
 Alyan gravelly clay loam, 4 to 15 percent slopes--25 percent  
 Quarz very gravelly loam, 15 to 30 percent slopes--25 percent

#### ***Contrasting Inclusions***

Inclusion 1: Ninemile gravelly loam, 4 to 15 percent slopes--8 percent  
 Inclusion 2: Welch silt loam, drained, 0 to 2 percent slopes, rarely flooded--4 percent  
 Inclusion 3: Reluctan gravelly loam, 15 to 30 percent slopes--2 percent  
 Inclusion 4: Lithic Xerollic Haplargids, loamy-skeletal, mixed, frigid very gravelly loam--1 percent

### ***Map Unit Setting***

*Landscape position:* Hills  
 Alyan--Landform: Hills; geomorphic position: backslope; aspect: north  
 Alyan--Landform: Hills; geomorphic position: backslope; position on slope: upper; aspect: north  
 Quarz--Landform: Hills; geomorphic position: backslope; aspect: south  
 Inclusion 1--Landform: Hills; geomorphic position: summit; shape of slope: convex  
 Inclusion 2--Landform: Drainageways  
 Inclusion 3--Landform: Hills; geomorphic position: backslope  
 Inclusion 4--Landform: Hills; geomorphic position: backslope; aspect: south

### ***Major Component Description***

#### ***Alyan Series***

*Elevation:* 5,600 to 6,000 feet  
*Precipitation:* About 12 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days

*Surface layer texture:* Gravelly clay loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from tuffaceous rocks

#### ***Alyan Series***

*Elevation:* 5,800 to 6,000 feet  
*Precipitation:* About 12 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Gravelly clay loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from tuffaceous rocks

#### ***Quarz Series***

*Elevation:* 5,600 to 6000 feet  
*Precipitation:* About 12 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Very gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from tuffaceous rocks

### ***Dominant Present Vegetation***

Alyan: Idaho fescue, bluebunch wheatgrass, mountain big sagebrush, rabbitbrush  
 Alyan: Idaho fescue, bluebunch wheatgrass, mountain big sagebrush, rabbitbrush  
 Quarz: Antelope bitterbrush, basin wildrye, big sagebrush, bluebunch wheatgrass  
 Inclusion 1: Bluegrass, low sagebrush  
 Inclusion 2: Basin big sagebrush, basin wildrye, bluegrass  
 Inclusion 3: Bluebunch wheatgrass, mountain big sagebrush  
 Inclusion 4: Big sagebrush

### ***Ecological Site***

Alyan: 025XY027NV  
 Alyan: 025XY027NV  
 Quarz: 025XY009NV  
 Inclusion 1: 025XY017NV  
 Inclusion 2: 025XY003NV  
 Inclusion 3: 025XY012NV  
 Inclusion 4: 025XY015NV

## **2003--Alyan-Deepeek-Susie Creek association**

### ***Composition***

#### ***Major Components***

Alyan very gravelly loam, 15 to 30 percent slopes--35 percent  
 Deepeek very cobbly loam, 8 to 15 percent slopes--25 percent  
 Susie Creek very fine sandy loam, 4 to 15 percent slopes--25 percent



**Contrasting Inclusions**

- Inclusion 1: Bartome very fine sandy loam, 2 to 4 percent slopes--5 percent  
 Inclusion 2: Bilbo very gravelly very fine sandy loam, 15 to 30 percent slopes--5 percent  
 Inclusion 3: Haploxerollic Durargids, loamy-skeletal, mixed, mesic gravelly loam, 15 to 30 percent slopes--3 percent  
 Inclusion 4: Rock outcrop--2 percent

**Map Unit Setting**

*Landscape position:* Hills

Alyan--Landform: Hills; geomorphic position: backslope; position on slope: upper part

Deepeek--Landform: Hills; geomorphic position: backslope

Susie Creek--Landform: Hills; geomorphic position: footslope

Inclusion 1--Landform: Hills; geomorphic position: summit

Inclusion 2--Landform: Hills; geomorphic position: backslope; aspect: south

Inclusion 3--Landform: Hills; geomorphic position: shoulder; aspect: south

Inclusion 4--Landform: Hills

**Major Component Description****Alyan Series**

*Elevation:* 5,100 to 5,700 feet

*Precipitation:* About 12 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Very gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from tuffaceous rocks

**Deepeek Series**

*Elevation:* 5,100 to 5,700 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 105 days

*Surface layer texture:* Very cobbly loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium and colluvium derived from mixed rocks

**Susie Creek Series**

*Elevation:* 5,100 to 5,600 feet

*Precipitation:* About 11 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 90 days

*Surface layer texture:* Very fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from tuffaceous rocks

**Dominant Present Vegetation**

Alyan: Big sagebrush, bottlebrush squirreltail, cheatgrass

Deepeek: Wyoming big sagebrush, bottlebrush squirreltail, cheatgrass

Susie Creek: Basin big sagebrush, bluebunch wheatgrass, bluegrass, rabbitbrush

Inclusion 1: Wyoming big sagebrush, cheatgrass, squirreltail

Inclusion 2: Big sagebrush, cheatgrass

Inclusion 3: Big sagebrush, cheatgrass

Inclusion 4: None

**Ecological Site**

Alyan: 025XY014NV

Deepeek: 025XY019NV

Susie Creek: 025XY014NV

Inclusion 1: 025XY019NV

Inclusion 2: 025XY015NV

Inclusion 3: 025XY015NV

Inclusion 4: None

**2004--Alyan, cobbly loam-Ninemile-Alyan association****Composition****Major Components**

Alyan cobbly loam, 15 to 50 percent slopes--35 percent

Ninemile gravelly loam, 4 to 15 percent slopes--30 percent

Alyan gravelly loam, 4 to 15 percent slopes--25 percent

**Contrasting Inclusions**

Inclusion 1: Lithic Haploxerolls, loamy-skeletal, mixed, frigid very gravelly loam--7 percent

Inclusion 2: Welch silt loam, 2 to 8 percent slopes, frequently flooded--1 percent

Inclusion 3: Welch silt loam, drained, 2 to 8 percent slopes, rarely flooded--1 percent

Inclusion 4: Rock outcrop--1 percent

**Map Unit Setting**

*Landscape position:* Mountains

Alyan--Landform: Mountains; geomorphic position: backslope; aspect: north

Ninemile--Landform: Mountains; geomorphic position: summit

Alyan--Landform: Mountains; geomorphic position: summit; aspect: north

Inclusion 1--Landform: Mountains; geomorphic position: shoulder

Inclusion 2--Landform: Drainageways

Inclusion 3--Landform: Drainageways

Inclusion 4--Landform: Mountains

**Major Component Description****Alyan Series**

*Elevation:* 5,400 to 6,400 feet

*Precipitation:* About 12 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Cobbly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

#### **Ninemile Series**

*Elevation:* 5,600 to 6,400 feet

*Precipitation:* About 14 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from volcanic rocks

#### **Alyan Series**

*Elevation:* 5,700 to 6,400 feet

*Precipitation:* About 12 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

#### ***Dominant Present Vegetation***

Alyan: Idaho fescue, bluebunch wheatgrass

Ninemile: Bluegrass, low sagebrush

Alyan: Big sagebrush, bottlebrush squirreltail, cheatgrass

Inclusion 1: Big sagebrush, bottlebrush squirreltail, cheatgrass

Inclusion 2: Rush, sedge, willow

Inclusion 3: Basin big sagebrush, basin wildrye, bluegrass

Inclusion 4: None

#### ***Ecological Site***

Alyan: 025XY012NV

Ninemile: 025XY017NV

Alyan: 025XY014NV

Inclusion 1: 025XY014NV

Inclusion 2: 025XY005NV

Inclusion 3: 025XY003NV

Inclusion 4: None

### **2005--Alyan-Graley-Rock outcrop association**

#### ***Composition***

#### ***Major Components***

Alyan gravelly loam, 4 to 15 percent slopes--50 percent

Graley very stony loam, 30 to 50 percent slopes--25 percent

Rock outcrop--15 percent

#### **Contrasting Inclusions**

**Inclusion 1:** Puett gravelly loam, 30 to 50 percent slopes--5 percent

**Inclusion 2:** Welch silt loam, drained, 0 to 2 percent slopes, rarely flooded--5 percent

#### ***Map Unit Setting***

*Landscape position:* Mountains

Alyan--Landform: Mountains; geomorphic position: summit; position on slope: upper part

Graley--Landform: Mountains; geomorphic position: backslope

Rock outcrop--Landform: Mountains; geomorphic position: summit

Inclusion 1--Landform: Mountains; geomorphic position: backslope; aspect: south

Inclusion 2--Landform: Drainageways

#### ***Major Component Description***

#### **Alyan Series**

*Elevation:* 6,000 to 7,500 feet

*Precipitation:* About 12 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

#### **Graley Series**

*Elevation:* 6,000 to 7,500 feet

*Precipitation:* About 14 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Very stony loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from quartzite

#### **Rock outcrop Miscellaneous Area**

*Elevation:* 6,000 to 7,500 feet

*Drainage class:* Excessively drained

#### ***Dominant Present Vegetation***

Alyan: Big sagebrush, bottlebrush squirreltail, cheatgrass

Graley: Idaho fescue, antelope bitterbrush, bluebunch wheatgrass, mountain big sagebrush

Rock outcrop: None

Inclusion 1: Indian ricegrass, Wyoming big sagebrush, cheatgrass, rabbitbrush

Inclusion 2: Basin big sagebrush, basin wildrye, bluegrass

#### ***Ecological Site***

Alyan: 025XY014NV

Graley: 025XY012NV

Rock outcrop: None

Inclusion 1: 025XY025NV

Inclusion 2: 025XY003NV



**2171--Deseed-Reluctan-Cleavage association****Composition****Major Components**

Deseed gravelly loam, 15 to 30 percent slopes--45 percent

Reluctan gravelly loam, 15 to 30 percent slopes--25 percent

Cleavage very gravelly loam, 4 to 8 percent slopes--15 percent

**Contrasting Inclusions**

Inclusion 1: Chen very cobbly loam, 4 to 15 percent slopes--6 percent

Inclusion 2: Carstump gravelly loam, 4 to 15 percent slopes--4 percent

Inclusion 3: Rock outcrop--3 percent

Inclusion 4: Rubble land fragmental material--2 percent

**Map Unit Setting**

*Landscape position:* Mountains

Deseed--Landform: Mountains; geomorphic position: backslope

Reluctan--Landform: Mountains; geomorphic position: shoulder

Cleavage--Landform: Mountains; geomorphic position: summit

Inclusion 1--Landform: Mountains; geomorphic position: shoulder

Inclusion 2--Landform: Mountains; geomorphic position: backslope; shape of slope: concave

Inclusion 3--Landform: Mountains; geomorphic position: backslope

Inclusion 4--Landform: Mountains; geomorphic position: backslope

**Major Component Description****Deseed Series**

*Elevation:* 5,600 to 7,100 feet

*Precipitation:* About 11 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

**Reluctan Series**

*Elevation:* 5,600 to 7,100 feet

*Precipitation:* About 12 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

**Cleavage Series**

*Elevation:* 5,600 to 7,100 feet

*Precipitation:* About 14 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Very gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from volcanic rocks

**Dominant Present Vegetation**

Deseed: Big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Reluctan: Bluegrass, bottlebrush squirreltail, mountain big sagebrush, rabbitbrush

Cleavage: Idaho fescue, bluegrass, bottlebrush squirreltail, low sagebrush

Inclusion 1: Bluegrass, low sagebrush

Inclusion 2: Big sagebrush

Inclusion 3: None

Inclusion 4: None

**Ecological Site**

Deseed: 025XY014NV

Reluctan: 025XY012NV

Cleavage: 025XY017NV

Inclusion 1: 025XY017NV

Inclusion 2: 025XY014NV

Inclusion 3: None

Inclusion 4: None

**2173--Deseed-Quarz association****Composition****Major Components**

Deseed gravelly loam, 15 to 30 percent slopes--55 percent

Quarz very cobbly loam, 4 to 8 percent slopes--30 percent

**Contrasting Inclusions**

Inclusion 1: Rock outcrop--7 percent

Inclusion 2: Xerollic Haplargids, loamy-skeletal, mixed, frigid gravelly loam, 4 to 15 percent slopes--5 percent

Inclusion 3: Rubble land fragmental material--2 percent

Inclusion 4: Reluctan gravelly loam, 15 to 50 percent slopes--1 percent

**Map Unit Setting**

*Landscape position:* Hills

Deseed--Landform: Hills; geomorphic position: backslope

Quarz--Landform: Hills; geomorphic position: summit

Inclusion 1--Landform: Hills; geomorphic position: backslope

Inclusion 2--Landform: Hills; geomorphic position: backslope

Inclusion 3--Landform: Hills; geomorphic position: backslope

Inclusion 4--Landform: Hills; geomorphic position: backslope; aspect: northeast

**Major Component Description****Deseed Series**

*Elevation:* 5,100 to 6,300 feet

*Precipitation:* About 11 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

#### **Quarz Series**

*Elevation:* 5,700 to 6,300 feet  
*Precipitation:* About 12 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Very cobbly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

#### ***Dominant Present Vegetation***

Deseed: Big sagebrush, bluegrass  
 Quarz: Big sagebrush  
 Inclusion 1: None  
 Inclusion 2: Big sagebrush  
 Inclusion 3: None  
 Inclusion 4: Bluebunch wheatgrass, mountain big sagebrush

#### ***Ecological Site***

Deseed: 025XY014NV  
 Quarz: 025XY014NV  
 Inclusion 1: None  
 Inclusion 2: 025XY014NV  
 Inclusion 3: None  
 Inclusion 4: 025XY012NV

### **2205--Coltroop-Snowmore association**

#### ***Composition***

##### ***Major Components***

Coltroop very fine sandy loam, 0 to 2 percent slopes--50 percent  
 Snowmore very fine sandy loam, 2 to 4 percent slopes--35 percent

##### ***Contrasting Inclusions***

Inclusion 1: Linkup gravelly clay loam, 4 to 15 percent slopes--5 percent  
 Inclusion 2: Olac cobbly loam, 4 to 8 percent slopes--4 percent  
 Inclusion 3: Clurde very fine sandy loam, 0 to 2 percent slopes--3 percent  
 Inclusion 4: Clurde Variant very gravelly sandy loam, 0 to 7 percent slopes--3 percent

#### ***Map Unit Setting***

*Landscape position:* Plateaus  
 Coltroop--Landform: Plateaus; geomorphic position: summit  
 Snowmore--Landform: Plateaus; geomorphic position: shoulder

Inclusion 1--Landform: Plateaus; geomorphic position: shoulder  
 Inclusion 2--Landform: Plateaus; geomorphic position: toeslope  
 Inclusion 3--Landform: Drainageways  
 Inclusion 4--Landform: Drainageways

#### ***Major Component Description***

##### **Coltroop Series**

*Elevation:* 5,100 to 5,500 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Very fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from volcanic rocks, loess and volcanic ash

##### **Snowmore Series**

*Elevation:* 5,100 to 5,500 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Very fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum derived from volcanic rocks

#### ***Dominant Present Vegetation***

Coltroop: Big sagebrush, bottlebrush squirreltail  
 Snowmore: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass  
 Inclusion 1: Bluegrass, low sagebrush  
 Inclusion 2: Bluegrass, low sagebrush  
 Inclusion 3: Wyoming big sagebrush, bottlebrush squirreltail  
 Inclusion 4: Wyoming big sagebrush, bottlebrush squirreltail

#### ***Ecological Site***

Coltroop: 025XY019NV  
 Snowmore: 025XY019NV  
 Inclusion 1: 025XY018NV  
 Inclusion 2: 025XY018NV  
 Inclusion 3: 025XY019NV  
 Inclusion 4: 025XY019NV

### **2206--Coltroop-Vanwyper association**

#### ***Composition***

##### ***Major Components***

Coltroop cobbly very fine sandy loam, 0 to 2 percent slopes--55 percent  
 Vanwyper very stony loam, 0 to 2 percent slopes--30 percent

##### ***Contrasting Inclusions***

Inclusion 1: Zevadez very fine sandy loam, 0 to 2 percent slopes--5 percent  
 Inclusion 2: Chiara cobbly silt loam, 2 to 4 percent slopes--5 percent



Inclusion 3: Rock outcrop--5 percent

### **Map Unit Setting**

*Landscape position:* Plateaus

Coltroop--Landform: Plateaus; geomorphic position: summit

Vanwyper--Landform: Plateaus; geomorphic position: summit

Inclusion 1--Landform: Plateaus; geomorphic position: footslope

Inclusion 2--Landform: Plateaus; geomorphic position: toeslope

Inclusion 3--Landform: Plateaus; geomorphic position: backslope

### **Major Component Description**

#### **Coltroop Variant**

*Elevation:* 5,200 to 5,400 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 105 days

*Surface layer texture:* Cobbly very fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from volcanic rocks, loess and volcanic ash

#### **Vanwyper Series**

*Elevation:* 5,200 to 5,400 feet

*Precipitation:* About 10 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Very stony loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

### **Dominant Present Vegetation**

Coltroop: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Vanwyper: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Inclusion 1: Wyoming big sagebrush, bottlebrush squirreltail, cheatgrass

Inclusion 2: Wyoming big sagebrush, bottlebrush squirreltail, cheatgrass

Inclusion 3: None

### **Ecological Site**

Coltroop: 025XY019NV

Vanwyper: 025XY019NV

Inclusion 1: 025XY019NV

Inclusion 2: 025XY019NV

Inclusion 3: None

## **2310--Bulake-Deunah-Bulake, very cobbly association**

### **Composition**

#### **Major Components**

Bulake gravelly loam, 2 to 8 percent slopes--45 percent

Deunah loam, 2 to 4 percent slopes--20 percent

Bulake very cobbly very fine sandy loam, 2 to 8 percent slopes--20 percent

### **Contrasting Inclusions**

Inclusion 1: Hatpeak stony loam, 4 to 15 percent slopes--7 percent

Inclusion 2: Rock outcrop--4 percent

Inclusion 3: Rubble land fragmental material--2 percent

Inclusion 4: Durargidic Argixerolls, fine-loamy, mixed, frigid gravelly loam, 15 to 30 percent slopes--2 percent

### **Map Unit Setting**

*Landscape position:* Hills

Bulake--Landform: Hills; geomorphic position: backslope

Deunah--Landform: Hills; geomorphic position: summit

Bulake--Landform: Hills; geomorphic position: toeslope

Inclusion 1--Landform: Hills; geomorphic position: summit

Inclusion 2--Landform: Hills; geomorphic position: backslope

Inclusion 3--Landform: Hills; geomorphic position: backslope

Inclusion 4--Landform: Hills; geomorphic position: backslope

### **Major Component Description**

#### **Bulake Series**

*Elevation:* 5,300 to 6,000 feet

*Precipitation:* About 14 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from volcanic rocks

#### **Deunah Series**

*Elevation:* 5,300 to 6,000 feet

*Precipitation:* About 14 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from volcanic rocks, loess and volcanic ash

#### **Bulake Series**

*Elevation:* 5,300 to 6,000 feet

*Precipitation:* About 14 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Very cobbly very fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from volcanic rocks

### **Dominant Present Vegetation**

Bulake: Bluegrass, bottlebrush squirreltail, low sagebrush

Deunah: Idaho fescue, alkali sagebrush, bluebunch wheatgrass

Bulake: Bluegrass, bottlebrush squirreltail, low sagebrush

Inclusion 1: Idaho fescue, basin big sagebrush

Inclusion 2: None

Inclusion 3: None

Inclusion 4: Idaho fescue, basin big sagebrush

#### **Ecological Site**

Bulake: 025XY017NV

Deunah: 025XY017NV

Bulake: 025XY017NV

Inclusion 1: 025XY027NV

Inclusion 2: None

Inclusion 3: None

Inclusion 4: 025XY027NV

### **2311--Bulake-Hatpeak-Petan association**

#### **Composition**

##### **Major Components**

Bulake very cobbly very fine sandy loam, 2 to 8 percent slopes--55 percent

Hatpeak loam, 2 to 8 percent slopes--15 percent

Petan very stony loam, 2 to 8 percent slopes--15 percent

##### **Contrasting Inclusions**

Inclusion 1: McIvey cobbly loam, 15 to 50 percent slopes--5 percent

Inclusion 2: Cumulic Haplaquolls, loamy-skeletal, mixed, frigid silt loam--5 percent

Inclusion 3: Bilbo very gravelly very fine sandy loam, 30 to 50 percent slopes--3 percent

Inclusion 4: Gumble very gravelly sandy loam, 15 to 50 percent slopes--2 percent

#### **Map Unit Setting**

*Landscape position:* Plateaus

Bulake--Landform: Plateaus; geomorphic position: summit; shape of slope: plane

Hatpeak--Landform: Plateaus; geomorphic position: summit; shape of slope: convex

Petan--Landform: Plateaus; geomorphic position: summit; shape of slope: plane

Inclusion 1--Landform: Plateaus; geomorphic position: backslope; aspect: north

Inclusion 2--Landform: Drainageways

Inclusion 3--Landform: Plateaus; geomorphic position: backslope; aspect: south

Inclusion 4--Landform: Plateaus; geomorphic position: backslope; shape of slope: convex; aspect: south

#### **Major Component Description**

##### **Bulake Series**

*Elevation:* 5,300 to 5,700 feet

*Precipitation:* About 14 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Very cobbly very fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from volcanic rocks

##### **Hatpeak Series**

*Elevation:* 5,300 to 5,700 feet

*Precipitation:* About 14 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

##### **Petan Series**

*Elevation:* 5,300 to 5,700 feet

*Precipitation:* About 14 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Very stony loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from volcanic rocks

#### **Dominant Present Vegetation**

Bulake: Idaho fescue, bluegrass, low sagebrush

Hatpeak: Idaho fescue, basin big sagebrush, bluebunch wheatgrass

Petan: Bluegrass, bottlebrush squirreltail, low sagebrush

Inclusion 1: Idaho fescue, mountain big sagebrush

Inclusion 2: Nevada bluegrass, alpine timothy

Inclusion 3: Big sagebrush, bluebunch wheatgrass, cheatgrass

Inclusion 4: Big sagebrush, bluebunch wheatgrass, cheatgrass

#### **Ecological Site**

Bulake: 025XY017NV

Hatpeak: 025XY027NV

Petan: 025XY022NV

Inclusion 1: 025XY012NV

Inclusion 2: 025XY006NV

Inclusion 3: 025XY015NV

Inclusion 4: 025XY015NV

### **2505--Buffaran-Zevadez association**

#### **Composition**

##### **Major Components**

Buffaran very fine sandy loam, 0 to 4 percent slopes--50 percent

Zevadez very fine sandy loam, 2 to 4 percent slopes--35 percent

##### **Contrasting Inclusions**

Inclusion 1: Haploxerollic Durargids, fine, montmorillonitic, mesic gravelly loam, 0 to 4 percent slopes--6 percent



Inclusion 2: Xerollic Camborthids, loamy-skeletal, mixed, mesic gravelly loam, 4 to 8 percent slopes--5 percent

Inclusion 3: Puett gravelly loam, 8 to 15 percent slopes--2 percent

Inclusion 4: Xerollic Haplargids, loamy-skeletal, mixed, mesic gravelly loam--2 percent

#### **Map Unit Setting**

*Landscape position:* Fan piedmonts

Buffaran--Landform: Fan remnants; geomorphic position: toeslope

Zevadez--Landform: Fan remnants; geomorphic position: backslope

Inclusion 1--Landform: Fan remnants; geomorphic position: shoulder

Inclusion 2--Landform: Inset fans

Inclusion 3--Landform: Fan remnants; geomorphic position: backslope; aspect: south

Inclusion 4--Landform: Fan remnants; geomorphic position: backslope; aspect: south

#### **Major Component Description**

##### **Buffaran Series**

*Elevation:* 5,200 to 5,700 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Very fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

##### **Zevadez Series**

*Elevation:* 5,200 to 5,700 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Very fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

#### **Dominant Present Vegetation**

Buffaran: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Zevadez: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Inclusion 1: Wyoming big sagebrush, bottlebrush squirreltail

Inclusion 2: Wyoming big sagebrush, bottlebrush squirreltail

Inclusion 3: Indian ricegrass, Wyoming big sagebrush

Inclusion 4: Big sagebrush, cheatgrass

#### **Ecological Site**

Buffaran: 025XY019NV

Zevadez: 025XY019NV

Inclusion 1: 025XY019NV

Inclusion 2: 025XY019NV

Inclusion 3: 025XY025NV

Inclusion 4: 025XY015NV

### **2511--Bilbo-Alley-Deepeek association**

#### **Composition**

##### **Major Components**

Bilbo extremely stony sandy loam, 30 to 50 percent slopes--35 percent

Alley very stony loam, 50 to 70 percent slopes--25 percent

Deepeek very cobbly loam, 30 to 50 percent slopes--25 percent

##### **Contrasting Inclusions**

Inclusion 1: Rock outcrop--5 percent

Inclusion 2: Rubble land fragmental material--5 percent

Inclusion 3: Durixerollic Haplargids, clayey-skeletal, montmorillonitic, mesic very cobbly loam, 15 to 30 percent slopes--4 percent

Inclusion 4: Puett gravelly loam, 30 to 50 percent slopes--1 percent

#### **Map Unit Setting**

*Landscape position:* Plateaus

Bilbo--Landform: Plateaus; geomorphic position: backslope; position on slope: lower part

Alley--Landform: Plateaus; geomorphic position: backslope; position on slope: upper part

Deepeek--Landform: Plateaus; geomorphic position: backslope

Inclusion 1--Landform: Plateaus; geomorphic position: backslope

Inclusion 2--Landform: Plateaus; geomorphic position: backslope

Inclusion 3--Landform: Plateaus; geomorphic position: toeslope

Inclusion 4--Landform: Canyons; geomorphic position: shoulder

#### **Major Component Description**

##### **Bilbo Series**

*Elevation:* 4,800 to 5,600 feet

*Precipitation:* About 10 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Extremely stony sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

##### **Alley Series**

*Elevation:* 5,000 to 5,600 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Very stony loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

**Deepeek Series***Elevation:* 5,200 to 5,600 feet*Precipitation:* About 9 inches*Air temperature:* About 47 degrees*Frost-free season:* About 105 days*Surface layer texture:* Very cobbly loam*Drainage class:* Well drained*Dominant parent material:* Alluvium and colluvium derived from mixed rocks***Dominant Present Vegetation***

Bilbo: Big sagebrush, bluebunch wheatgrass, cheatgrass

Alley: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Deepeek: Big sagebrush, bluebunch wheatgrass, cheatgrass

Inclusion 1: None

Inclusion 2: None

Inclusion 3: Wyoming big sagebrush, bottlebrush squirreltail

Inclusion 4: Indian ricegrass, Wyoming big sagebrush

***Ecological Site***

Bilbo: 025XY015NV

Alley: 025XY019NV

Deepeek: 025XY015NV

Inclusion 1: None

Inclusion 2: None

Inclusion 3: 025XY019NV

Inclusion 4: 025XY025NV

**2514--Bilbo-Susie Creek-Bufferan association*****Composition******Major Components***

Bilbo very gravelly very fine sandy loam, 15 to 30 percent slopes--35 percent

Susie Creek very fine sandy loam, 4 to 15 percent slopes--30 percent

Bufferan very fine sandy loam, 2 to 4 percent slopes--20 percent

***Contrasting Inclusions***

Inclusion 1: Alyan very gravelly very fine sandy loam, 15 to 50 percent slopes--5 percent

Inclusion 2: Ramires silt loam, 8 to 15 percent slopes--5 percent

Inclusion 3: Zevadez gravelly loam, 2 to 4 percent slopes--4 percent

Inclusion 4: Puett gravelly loam, 30 to 50 percent slopes--1 percent

***Map Unit Setting****Landscape position:* Fan piedmonts

Bilbo--Landform: Fan remnants; geomorphic position: backslope; aspect: south

Susie Creek--Landform: Fan remnants; geomorphic position: backslope; aspect: north

Bufferan--Landform: Fan remnants; geomorphic position: summit

Inclusion 1--Landform: Fan remnants; geomorphic position: backslope; shape of slope: convex

Inclusion 2--Landform: Fan remnants; geomorphic position: backslope; shape of slope: plane

Inclusion 3--Landform: Fan remnants; geomorphic position: toeslope

Inclusion 4--Landform: Fan remnants; geomorphic position: backslope; shape of slope: convex; aspect: south

***Major Component Description*****Bilbo Series***Elevation:* 5,100 to 6,000 feet*Precipitation:* About 10 inches*Air temperature:* About 47 degrees*Frost-free season:* About 110 days*Surface layer texture:* Very gravelly very fine sandy loam*Drainage class:* Well drained*Dominant parent material:* Alluvium derived from mixed rocks**Susie Creek Series***Elevation:* 5,100 to 6,000 feet*Precipitation:* About 11 inches*Air temperature:* About 44 degrees*Frost-free season:* About 90 days*Surface layer texture:* Very fine sandy loam*Drainage class:* Well drained*Dominant parent material:* Residuum derived from tuffaceous rocks**Bufferan Series***Elevation:* 5,100 to 6,000 feet*Precipitation:* About 9 inches*Air temperature:* About 47 degrees*Frost-free season:* About 110 days*Surface layer texture:* Very fine sandy loam*Drainage class:* Well drained*Dominant parent material:* Alluvium derived from mixed rocks***Dominant Present Vegetation***

Bilbo: Bluebunch wheatgrass, bluegrass, bottlebrush squirreltail, cheatgrass

Susie Creek: Basin big sagebrush, bluebunch wheatgrass, bluegrass, rabbitbrush

Bufferan: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Inclusion 1: Big sagebrush, bottlebrush squirreltail

Inclusion 2: Big sagebrush, bottlebrush squirreltail

Inclusion 3: Wyoming big sagebrush, bottlebrush squirreltail

Inclusion 4: Indian ricegrass, Wyoming big sagebrush

***Ecological Site***

Bilbo: 025XY015NV

Susie Creek: 025XY014NV

Bufferan: 025XY019NV

Inclusion 1: 025XY014NV

Inclusion 2: 025XY014NV



Inclusion 3: 025XY019NV

Inclusion 4: 025XY025NV

## **2521--Dewar-Chiara-Chiara, very cobbly association**

### ***Composition***

#### ***Major Components***

Dewar very cobbly very fine sandy loam, 8 to 15 percent slopes--55 percent

Chiara very fine sandy loam, 2 to 4 percent slopes--15 percent

Chiara very cobbly very fine sandy loam, 4 to 8 percent slopes--15 percent

#### ***Contrasting Inclusions***

Inclusion 1: Coltroop cobbly very fine sandy loam, 0 to 2 percent slopes--7 percent

Inclusion 2: Xerollic Durargids, fine, montmorillonitic, mesic gravelly loam, 4 to 8 percent slopes--6 percent

Inclusion 3: Rock outcrop--2 percent

### ***Map Unit Setting***

*Landscape position:* Intermontane basins

Dewar--Landform: Fan remnants; geomorphic position: backslope; position on slope: upper part

Chiara--Landform: Fan remnants; geomorphic position: backslope; position on slope: lower; shape of slope: concave

Chiara--Landform: Fan remnants; geomorphic position: footslope

Inclusion 1--Landform: Hills; geomorphic position: summit

Inclusion 2--Landform: Fan remnants; geomorphic position: toeslope

Inclusion 3--Landform: Hills

### ***Major Component Description***

#### ***Dewar Series***

*Elevation:* 5,100 to 5,600 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Very cobbly very fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

#### ***Chiara Series***

*Elevation:* 5,100 to 5,600 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 105 days

*Surface layer texture:* Very fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

#### ***Chiara Series***

*Elevation:* 5,100 to 5,600 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 105 days

*Surface layer texture:* Very cobbly very fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

### ***Dominant Present Vegetation***

Dewar: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Chiara: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Chiara: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Inclusion 1: Wyoming big sagebrush, bottlebrush squirreltail

Inclusion 2: Wyoming big sagebrush, bottlebrush squirreltail

Inclusion 3: None

### ***Ecological Site***

Dewar: 025XY019NV

Chiara: 025XY019NV

Chiara: 025XY019NV

Inclusion 1: 025XY019NV

Inclusion 2: 025XY019NV

Inclusion 3: None

## **2522--Dewar-Sodhouse association**

### ***Composition***

#### ***Major Components***

Dewar very cobbly very fine sandy loam, 4 to 8 percent slopes--55 percent

Sodhouse cobbly silt loam, 2 to 4 percent slopes--30 percent

#### ***Contrasting Inclusions***

Inclusion 1: Dacker very cobbly sandy loam, 2 to 4 percent slopes--5 percent

Inclusion 2: Clurde very fine sandy loam, 2 to 4 percent slopes--5 percent

Inclusion 3: Relley silt loam, 0 to 2 percent slopes, frequently flooded--3 percent

Inclusion 4: Rock outcrop--2 percent

### ***Map Unit Setting***

*Landscape position:* Fan piedmonts

Dewar--Landform: Fan remnants; geomorphic position: backslope

Sodhouse--Landform: Fan remnants; geomorphic position: summit

Inclusion 1--Landform: Fan remnants; geomorphic position: backslope; shape of slope: convex

Inclusion 2--Landform: Inset fans

Inclusion 3--Landform: Inset fans

Inclusion 4--Landform: Fan remnants; geomorphic position: backslope

**Major Component Description****Dewar Series***Elevation:* 5,100 to 5,300 feet*Precipitation:* About 9 inches*Air temperature:* About 47 degrees*Frost-free season:* About 110 days*Surface layer texture:* Very cobbly very fine sandy loam*Drainage class:* Well drained*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash**Sodhouse Series***Elevation:* 5,100 to 5,300 feet*Precipitation:* About 8 inches*Air temperature:* About 48 degrees*Frost-free season:* About 110 days*Surface layer texture:* Cobbly silt loam*Drainage class:* Well drained*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash**Dominant Present Vegetation**

Dewar: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Sodhouse: Bottlebrush squirreltail, winterfat, winterfat

Inclusion 1: Wyoming big sagebrush, bottlebrush squirreltail

Inclusion 2: Wyoming big sagebrush, bottlebrush squirreltail

Inclusion 3: Indian ricegrass, shadscale

Inclusion 4: None

**Ecological Site**

Dewar: 023XY006NV

Sodhouse: 024XY059NV

Inclusion 1: 025XY019NV

Inclusion 2: 025XY019NV

Inclusion 3: 024XY012NV

Inclusion 4: None

**2531--Clurde Variant-Clurde-Rock outcrop association****Composition****Major Components**

Clurde Variant loam, 0 to 2 percent slopes, occasionally flooded--50 percent

Clurde very fine sandy loam, 0 to 2 percent slopes--20 percent

Rock outcrop--15 percent

**Contrasting Inclusions**

Inclusion 1: Xerollic Haplargids, fine, montmorillonitic, mesic gravelly loam, 0 to 4 percent slopes--7 percent

Inclusion 2: Durixerollic Camborthids, sandy-skeletal, mixed, mesic fine sandy loam, 0 to 4 percent slopes--3 percent

Inclusion 3: Durixerollic Camborthids, coarse-loamy, mixed, mesic fine sandy loam, 0 to 2 percent slopes--3 percent

Inclusion 4: Wieland loam, 0 to 2 percent slopes--2 percent

**Map Unit Setting***Landscape position:* Fan piedmonts

Clurde Variant--Landform: Inset fans

Clurde--Landform: Fan remnants; geomorphic position: toeslope

Rock outcrop--Landform: Fan remnants; geomorphic position: backslope

Inclusion 1--Landform: Inset fans

Inclusion 2--Landform: Fan remnants; geomorphic position: shoulder

Inclusion 3--Landform: Inset fans

Inclusion 4--Landform: Fan remnants; geomorphic position: toeslope

**Major Component Description****Clurde Variant***Elevation:* 5,100 to 5,500 feet*Precipitation:* About 9 inches*Air temperature:* About 47 degrees*Frost-free season:* About 110 days*Surface layer texture:* Loam*Drainage class:* Well drained*Dominant parent material:* Alluvium derived from mixed rocks**Clurde Series***Elevation:* 5,100 to 5,500 feet*Precipitation:* About 9 inches*Air temperature:* About 47 degrees*Frost-free season:* About 110 days*Surface layer texture:* Very fine sandy loam*Drainage class:* Well drained*Dominant parent material:* Alluvium derived from volcanic rocks, loess and volcanic ash**Rock outcrop Miscellaneous Area***Elevation:* 5,100 to 5,500 feet*Drainage class:* Excessively drained**Dominant Present Vegetation**

Clurde Variant: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Clurde: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Rock outcrop: None

Inclusion 1: Bluebunch wheatgrass, bluegrass

Inclusion 2: Wyoming big sagebrush, bottlebrush squirreltail

Inclusion 3: Wyoming big sagebrush, bottlebrush squirreltail

Inclusion 4: Wyoming big sagebrush, bottlebrush squirreltail

**Ecological Site**

Clurde Variant: 025XY019NV

Clurde: 025XY019NV

Rock outcrop: None

Inclusion 1: 025XY050NV



Inclusion 2: 025XY019NV  
 Inclusion 3: 025XY019NV  
 Inclusion 4: 025XY019NV

### **2541--Kelk very fine sandy loam, occasionally flooded, 0 to 2 percent slopes**

#### ***Composition***

#### ***Major Components***

Kelk very fine sandy loam, 0 to 2 percent slopes, occasionally flooded--85 percent

#### ***Contrasting Inclusions***

Inclusion 1: Clementine silt loam, drained, 0 to 2 percent slopes--8 percent  
 Inclusion 2: Clurde very fine sandy loam, 0 to 2 percent slopes--7 percent

#### ***Map Unit Setting***

*Landscape position:* Fan piedmonts  
 Kelk--Landform: Inset fans  
 Inclusion 1--Landform: Inset fans  
 Inclusion 2--Landform: Inset fans

#### ***Major Component Description***

#### ***Kelk Series***

*Elevation:* 5,100 to 5,500 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Very fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

#### ***Dominant Present Vegetation***

Kelk: Thurber needlegrass, Wyoming big sagebrush, basin big sagebrush  
 Inclusion 1: Basin big sagebrush, basin wildrye, bluegrass  
 Inclusion 2: Basin big sagebrush, basin wildrye, bluegrass

#### ***Ecological Site***

Kelk: 024XY006NV  
 Inclusion 1: 025XY003NV  
 Inclusion 2: 025XY019NV

### **2545--Kelk-Clurde association**

#### ***Composition***

#### ***Major Components***

Kelk very fine sandy loam, 0 to 2 percent slopes--60 percent  
 Clurde very fine sandy loam, 0 to 2 percent slopes--25 percent

#### ***Contrasting Inclusions***

Inclusion 1: Durixerollic Camborthids, coarse-loamy, mixed, mesic fine sandy loam, 0 to 2 percent slopes--5 percent

Inclusion 2: Durixerollic Camborthids, fine-loamy over sandy or sandy-skeletal, mixed, mesic fine sandy loam, 0 to 2 percent slopes--5 percent  
 Inclusion 3: Kelk very fine sandy loam, 0 to 2 percent slopes, occasionally flooded--5 percent

#### ***Map Unit Setting***

*Landscape position:* Fan piedmonts  
 Kelk--Landform: Inset fans  
 Clurde--Landform: Inset fans  
 Inclusion 1--Landform: Inset fans  
 Inclusion 2--Landform: Inset fans  
 Inclusion 3--Landform: Inset fans

#### ***Major Component Description***

#### ***Kelk Series***

*Elevation:* 5,100 to 5,500 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Very fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

#### ***Clurde Series***

*Elevation:* 5,100 to 5,500 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Very fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from volcanic rocks, loess and volcanic ash

#### ***Dominant Present Vegetation***

Kelk: Wyoming big sagebrush, bottlebrush squirreltail, cheatgrass, rabbitbrush  
 Clurde: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass  
 Inclusion 1: Wyoming big sagebrush, bottlebrush squirreltail  
 Inclusion 2: Wyoming big sagebrush, bottlebrush squirreltail  
 Inclusion 3: Basin big sagebrush, basin wildrye, rabbitbrush

#### ***Ecological Site***

Kelk: 025XY019NV  
 Clurde: 025XY019NV  
 Inclusion 1: 025XY019NV  
 Inclusion 2: 025XY019NV  
 Inclusion 3: 024XY006NV

### **2555--Piline silty clay loam**

#### ***Composition***

#### ***Major Components***

Piline silty clay loam, 0 to 2 percent slopes--85 percent

**Contrasting Inclusions**

Inclusion 1: McCleary silt loam, occasionally flooded--10 percent

Inclusion 2: McCleary cobbly sandy loam, rarely flooded--5 percent

**Map Unit Setting**

*Landscape position:* Bolsons

Piline--Landform: Lake plains

Inclusion 1--Landform: Lake plains; shape of slope: concave

Inclusion 2--Landform: Alluvial fans; geomorphic position: summit; shape of slope: convex

**Major Component Description****Piline Series**

*Elevation:* 5,200 to 5,400 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 105 days

*Surface layer texture:* Silty clay loam

*Drainage class:* Poorly drained

*Dominant parent material:* Alluvium derived from mixed rocks

**Dominant Present Vegetation**

Piline: Bluegrass, bottlebrush squirreltail, mat muhly

Inclusion 1: Mat muhly, povertyweed

Inclusion 2: Wyoming big sagebrush, bottlebrush squirreltail

**Ecological Site**

Piline: 025XY049NV

Inclusion 1: 025XY048NV

Inclusion 2: 025XY019NV

**2560--McCleary silt loam, occasionally flooded****Composition****Major Components**

McCleary silt loam, 0 to 2 percent slopes, occasionally flooded--85 percent

**Contrasting Inclusions**

Inclusion 1: McCleary very fine sandy loam, overwash, rarely flooded--10 percent

Inclusion 2: Piline silty clay loam, frequently flooded--3 percent

Inclusion 3: McCleary cobbly silt loam, rarely flooded--2 percent

**Map Unit Setting**

*Landscape position:* Bolsons

McCleary--Landform: Lake plains; shape of slope: concave

Inclusion 1--Landform: Lake plains; shape of slope: convex

Inclusion 2--Landform: Lake plains; position on slope: lower part; shape of slope: concave

Inclusion 3--Landform: Fan remnants; geomorphic position: summit; shape of slope: convex

**Major Component Description****McCleary Series**

*Elevation:* 5,300 to 5,400 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Silt loam

*Drainage class:* Very poorly drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

**Dominant Present Vegetation**

McCleary: Silver sagebrush

Inclusion 1: Wyoming big sagebrush, bottlebrush squirreltail

Inclusion 2: Bluegrass, mat muhly, povertyweed

Inclusion 3: Wyoming big sagebrush, bottlebrush squirreltail

**Ecological Site**

McCleary: 025XY048NV

Inclusion 1: 025XY019NV

Inclusion 2: 025XY049NV

Inclusion 3: 025XY019NV

**2561--McCleary cobbly silt loam, drained, rarely flooded****Composition****Major Components**

McCleary cobbly silt loam, 0 to 2 percent slopes, rarely flooded--85 percent

**Contrasting Inclusions**

Inclusion 1: McCleary silt loam, occasionally flooded--10 percent

Inclusion 2: Chiara very fine sandy loam, 0 to 2 percent slopes--5 percent

**Map Unit Setting**

*Landscape position:* Intermontane basins

McCleary--Landform: Fan skirts

Inclusion 1--Landform: Lake plains; shape of slope: convex

Inclusion 2--Landform: Fan remnants; geomorphic position: summit; shape of slope: convex

**Major Component Description****McCleary Series**

*Elevation:* 5,300 to 5,400 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Cobbly silt loam

*Drainage class:* Very poorly drained

*Dominant parent material:* Alluvium derived from volcanic rocks, loess and volcanic ash



***Dominant Present Vegetation***

McCleary: Wyoming big sagebrush, bottlebrush squirreltail

Inclusion 1: Mat muhly, povertyweed

Inclusion 2: Wyoming big sagebrush, bottlebrush squirreltail

***Ecological Site***

McCleary: 025XY019NV

Inclusion 1: 025XY048NV

Inclusion 2: 025XY019NV

## **2571--Chiara-Chiara, cobbly-Chiara, very cobbly association**

***Composition******Major Components***

Chiara very fine sandy loam, 0 to 2 percent slopes--40 percent

Chiara cobbly silt loam, 2 to 4 percent slopes--30 percent

Chiara very cobbly very fine sandy loam, 2 to 4 percent slopes--15 percent

***Contrasting Inclusions***

Inclusion 1: Shalake very fine sandy loam, 0 to 2 percent slopes--5 percent

Inclusion 2: Xerollic Haplargids, fine, montmorillonitic, mesic gravelly loam--5 percent

Inclusion 3: Coltroop cobbly very fine sandy loam, 0 to 2 percent slopes--5 percent

***Map Unit Setting***

*Landscape position:* Fan piedmonts

Chiara--Landform: Fan remnants; geomorphic position: backslope; position on slope: upper part

Chiara--Landform: Fan remnants; geomorphic position: summit; shape of slope: concave

Chiara--Landform: Fan remnants; geomorphic position: footslope; position on slope: lower part

Inclusion 1--Landform: Fan remnants; geomorphic position: summit; shape of slope: convex

Inclusion 2--Landform: Fan remnants; geomorphic position: toeslope

Inclusion 3--Landform: Hills; geomorphic position: summit

***Major Component Description******Chiara Series***

*Elevation:* 5,200 to 5,600 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 105 days

*Surface layer texture:* Very fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

***Chiara Series***

*Elevation:* 5,200 to 5,600 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 105 days

*Surface layer texture:* Cobbly silt loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

***Chiara Series***

*Elevation:* 5,200 to 5,600 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 105 days

*Surface layer texture:* Very cobbly very fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

***Dominant Present Vegetation***

Chiara: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Chiara: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Chiara: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Inclusion 1: Wyoming big sagebrush, bottlebrush squirreltail

Inclusion 2: Wyoming big sagebrush, bottlebrush squirreltail

Inclusion 3: Wyoming big sagebrush, bottlebrush squirreltail

***Ecological Site***

Chiara: 025XY019NV

Chiara: 025XY019NV

Chiara: 025XY019NV

Inclusion 1: 025XY019NV

Inclusion 2: 025XY019NV

Inclusion 3: 025XY019NV

## **2572--Chiara-Chiara, moderately eroded association**

***Composition******Major Components***

Chiara very fine sandy loam, 0 to 2 percent slopes--70 percent

Chiara silt loam, moderately eroded, 0 to 2 percent slopes--15 percent

***Contrasting Inclusions***

Inclusion 1: Shalake very fine sandy loam, 0 to 2 percent slopes--6 percent

Inclusion 2: Durixerollic Camborthids, fine-loamy over sandy or sandy-skeletal, mixed, mesic fine sandy loam--4 percent

Inclusion 3: Dacker very fine sandy loam, 2 to 4 percent slopes--3 percent

Inclusion 4: Xerollic Haplargids, fine, montmorillonitic, mesic gravelly loam--2 percent

***Map Unit Setting***

*Landscape position:* Intermontane basins

Chiara--Landform: Fan remnants; geomorphic position: summit

Chiara--Landform: Fan remnants; geomorphic position: summit

Inclusion 1--Landform: Fan remnants; geomorphic position: summit; shape of slope: concave

Inclusion 2--Landform: Hills; geomorphic position: footslope

Inclusion 3--Landform: Hills; geomorphic position: backslope

Inclusion 4--Landform: Drainageways

### ***Major Component Description***

#### **Chiara Series**

*Elevation:* 5,100 to 5,500 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 105 days

*Surface layer texture:* Very fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

#### **Chiara Series**

*Elevation:* 5,100 to 5,500 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 105 days

*Surface layer texture:* Silt loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

### ***Dominant Present Vegetation***

Chiara: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Chiara: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Inclusion 1: Wyoming big sagebrush, bottlebrush squirreltail

Inclusion 2: Wyoming big sagebrush

Inclusion 3: Wyoming big sagebrush

Inclusion 4: Bluebunch wheatgrass

### ***Ecological Site***

Chiara: 025XY019NV

Chiara: 025XY019NV

Inclusion 1: 025XY019NV

Inclusion 2: 025XY019NV

Inclusion 3: 025XY019NV

Inclusion 4: 025XY050NV

## **2573--Chiara, very cobbly-Chiara association**

### ***Composition***

#### ***Major Components***

Chiara very cobbly very fine sandy loam, 4 to 15 percent slopes--45 percent

Chiara cobbly silt loam, 2 to 4 percent slopes--40 percent

### ***Contrasting Inclusions***

Inclusion 1: Shalake very fine sandy loam, 2 to 4 percent slopes--5 percent

Inclusion 2: Xerollic Haplargids, fine, montmorillonitic, mesic extremely cobbly loam, 0 to 4 percent slopes--5 percent

Inclusion 3: Coltroop cobbly very fine sandy loam, 2 to 8 percent slopes--3 percent

Inclusion 4: Rock outcrop--2 percent

### ***Map Unit Setting***

*Landscape position:* Intermontane basins

Chiara--Landform: Fan remnants; geomorphic position: backslope

Chiara--Landform: Fan remnants; geomorphic position: backslope

Inclusion 1--Landform: Hills; geomorphic position: backslope

Inclusion 2--Landform: Drainageways

Inclusion 3--Landform: Hills; geomorphic position: summit

Inclusion 4--Landform: Hills; geomorphic position: summit

### ***Major Component Description***

#### **Chiara Series**

*Elevation:* 5,000 to 5,600 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 105 days

*Surface layer texture:* Very cobbly very fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

#### **Chiara Series**

*Elevation:* 5,200 to 5,600 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 105 days

*Surface layer texture:* Cobbly silt loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

### ***Dominant Present Vegetation***

Chiara: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Chiara: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Inclusion 1: Wyoming big sagebrush, bottlebrush squirreltail

Inclusion 2: Bluebunch wheatgrass, bottlebrush squirreltail

Inclusion 3: Wyoming big sagebrush, bottlebrush squirreltail

Inclusion 4: None



**Ecological Site**

Chiara: 025XY019NV  
 Chiara: 025XY019NV  
 Inclusion 1: 025XY019NV  
 Inclusion 2: 025XY050NV  
 Inclusion 3: 025XY019NV  
 Inclusion 4: None

**2575--Chiara-Dacker-Shalake association****Composition****Major Components**

Chiara very fine sandy loam, 0 to 2 percent slopes--40 percent  
 Dacker very fine sandy loam, 2 to 4 percent slopes--25 percent  
 Shalake very fine sandy loam, 0 to 2 percent slopes--20 percent

**Contrasting Inclusions**

Inclusion 1: Clurde very fine sandy loam, 0 to 2 percent slopes--10 percent  
 Inclusion 2: Durixerollic Camborthids, fine-loamy over sandy or sandy-skeletal, mixed, mesic fine sandy loam, 0 to 2 percent slopes--3 percent  
 Inclusion 3: Xerollic Haplargids, fine, montmorillonitic, mesic extremely cobbly loam, 0 to 4 percent slopes--2 percent

**Map Unit Setting**

**Landscape position:** Fan piedmonts  
 Chiara--Landform: Fan remnants; geomorphic position: summit  
 Dacker--Landform: Fan remnants; geomorphic position: backslope  
 Shalake--Landform: Fan remnants; geomorphic position: backslope  
 Inclusion 1--Landform: Fan remnants; geomorphic position: summit; shape of slope: concave  
 Inclusion 2--Landform: Inset fans  
 Inclusion 3--Landform: Fan remnants; geomorphic position: toeslope

**Major Component Description****Chiara Series**

**Elevation:** 5,100 to 5,600 feet  
**Precipitation:** About 9 inches  
**Air temperature:** About 47 degrees  
**Frost-free season:** About 105 days  
**Surface layer texture:** Very fine sandy loam  
**Drainage class:** Well drained  
**Dominant parent material:** Alluvium derived from mixed rocks, loess and volcanic ash

**Dacker Series**

**Elevation:** 5,100 to 5,600 feet  
**Precipitation:** About 9 inches  
**Air temperature:** About 47 degrees  
**Frost-free season:** About 110 days  
**Surface layer texture:** Very fine sandy loam  
**Drainage class:** Well drained

**Dominant parent material:** Alluvium derived from mixed rocks, loess and volcanic ash

**Shalake Series**

**Elevation:** 5,100 to 5,600 feet  
**Precipitation:** About 9 inches  
**Air temperature:** About 47 degrees  
**Frost-free season:** About 110 days  
**Surface layer texture:** Very fine sandy loam  
**Drainage class:** Well drained  
**Dominant parent material:** Alluvium derived from mixed rocks, loess and volcanic ash

**Dominant Present Vegetation**

Chiara: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass  
 Dacker: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass  
 Shalake: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail  
 Inclusion 1: Wyoming big sagebrush, bottlebrush squirreltail  
 Inclusion 2: Wyoming big sagebrush, bottlebrush squirreltail  
 Inclusion 3: Bluebunch wheatgrass, bottlebrush squirreltail

**Ecological Site**

Chiara: 025XY019NV  
 Dacker: 025XY019NV  
 Shalake: 025XY019NV  
 Inclusion 1: 025XY019NV  
 Inclusion 2: 025XY019NV  
 Inclusion 3: 025XY050NV

**2577--Chiara-Orovada association****Composition****Major Components**

Chiara very fine sandy loam, 2 to 8 percent slopes--50 percent  
 Orovada very fine sandy loam, 2 to 8 percent slopes--40 percent

**Contrasting Inclusions**

Inclusion 1: Chiara very cobbly sandy loam, 2 to 8 percent slopes--5 percent  
 Inclusion 2: Xeric Torripsamments, mixed, mesic fine sand, 2 to 8 percent slopes--5 percent

**Map Unit Setting**

**Landscape position:** Fan piedmonts  
 Chiara--Landform: Fan remnants; geomorphic position: summit  
 Orovada--Landform: Fan remnants; geomorphic position: summit  
 Inclusion 1--Landform: Fan remnants; geomorphic position: summit  
 Inclusion 2--Landform: Fan remnants; geomorphic position: summit

**Major Component Description****Chiara Series***Elevation:* 4,500 to 5,300 feet*Precipitation:* About 9 inches*Air temperature:* About 47 degrees*Frost-free season:* About 105 days*Surface layer texture:* Very fine sandy loam*Drainage class:* Well drained*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash**Orovada Series***Elevation:* 4,500 to 5,300 feet*Precipitation:* About 9 inches*Air temperature:* About 47 degrees*Frost-free season:* About 110 days*Surface layer texture:* Very fine sandy loam*Drainage class:* Well drained*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash**Dominant Present Vegetation**

Chiara: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Orovada: Thurber needlegrass, Wyoming big sagebrush, rabbitbrush

Inclusion 1: Wyoming big sagebrush, bottlebrush squirreltail

Inclusion 2: Basin big sagebrush

**Ecological Site**

Chiara: 024XY005NV

Orovada: 024XY020NV

Inclusion 1: 024XY005NV

Inclusion 2: 024XY001NV

**2600--Shalake-Chiara-Shalake, gently sloping association****Composition****Major Components**

Shalake very fine sandy loam, 0 to 2 percent slopes--35 percent

Chiara very fine sandy loam, 0 to 2 percent slopes--25 percent

Shalake very fine sandy loam, 2 to 4 percent slopes--25 percent

**Contrasting Inclusions**

Inclusion 1: Clurde very fine sandy loam, 0 to 2 percent slopes--5 percent

Inclusion 2: Xerollic Haplargids, fine, montmorillonitic, mesic extremely cobbly loam, 0 to 4 percent slopes--5 percent

Inclusion 3: Durixerollic Camborthids, fine-loamy over sandy or sandy-skeletal, mixed, mesic fine sandy loam, 0 to 4 percent slopes--3 percent

Inclusion 4: Zevadez very fine sandy loam, 0 to 2 percent slopes--2 percent

**Map Unit Setting***Landscape position:* Fan piedmonts

Shalake--Landform: Fan remnants; geomorphic position: summit

Chiara--Landform: Fan remnants; geomorphic position: summit

Shalake--Landform: Fan remnants; geomorphic position: backslope

Inclusion 1--Landform: Inset fans

Inclusion 2--Landform: Fan remnants; geomorphic position: summit

Inclusion 3--Landform: Drainageways

Inclusion 4--Landform: Drainageways

**Major Component Description****Shalake Series***Elevation:* 5,100 to 5,600 feet*Precipitation:* About 9 inches*Air temperature:* About 47 degrees*Frost-free season:* About 110 days*Surface layer texture:* Very fine sandy loam*Drainage class:* Well drained*Dominant parent material:* Alluvium derived from volcanic rocks, loess and volcanic ash**Chiara Series***Elevation:* 5,100 to 5,600 feet*Precipitation:* About 9 inches*Air temperature:* About 47 degrees*Frost-free season:* About 105 days*Surface layer texture:* Very fine sandy loam*Drainage class:* Well drained*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash**Shalake Series***Elevation:* 5,100 to 5,600 feet*Precipitation:* About 9 inches*Air temperature:* About 47 degrees*Frost-free season:* About 110 days*Surface layer texture:* Very fine sandy loam*Drainage class:* Well drained*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash**Dominant Present Vegetation**

Shalake: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail

Chiara: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Shalake: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail

Inclusion 1: Wyoming big sagebrush, bottlebrush squirreltail

Inclusion 2: Bluebunch wheatgrass

Inclusion 3: Wyoming big sagebrush, bottlebrush squirreltail

Inclusion 4: Wyoming big sagebrush, bottlebrush squirreltail



***Ecological Site***

Shalake: 025XY019NV  
 Chiara: 025XY019NV  
 Shalake: 025XY019NV  
 Inclusion 1: 025XY019NV  
 Inclusion 2: 025XY050NV  
 Inclusion 3: 025XY019NV  
 Inclusion 4: 025XY019NV

**2611--Dacker-Hunnton association*****Composition******Major Components***

Dacker silt loam, 2 to 4 percent slopes--55 percent  
 Hunnton silt loam, 2 to 4 percent slopes--30 percent

***Contrasting Inclusions***

Inclusion 1: Wieland loam, 2 to 4 percent slopes--7 percent  
 Inclusion 2: Bartome very fine sandy loam, 2 to 4 percent slopes--7 percent  
 Inclusion 3: Chiara very fine sandy loam, 2 to 4 percent slopes--1 percent

***Map Unit Setting***

*Landscape position:* Fan piedmonts  
 Dacker--Landform: Fan remnants; geomorphic position: summit  
 Hunnton--Landform: Fan remnants; geomorphic position: backslope  
 Inclusion 1--Landform: Fan remnants  
 Inclusion 2--Landform: Fan remnants; geomorphic position: summit  
 Inclusion 3--Landform: Fan remnants; geomorphic position: summit; shape of slope: convex

***Major Component Description*****Dacker Series**

*Elevation:* 5,200 to 5,300 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Silt loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

**Hunnton Series**

*Elevation:* 5,200 to 5,300 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Silt loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

***Dominant Present Vegetation***

Dacker: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Hunnton: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass  
 Inclusion 1: Wyoming big sagebrush, bottlebrush squirreltail  
 Inclusion 2: Wyoming big sagebrush, bottlebrush squirreltail  
 Inclusion 3: Wyoming big sagebrush, bottlebrush squirreltail

***Ecological Site***

Dacker: 025XY019NV  
 Hunnton: 025XY019NV  
 Inclusion 1: 025XY019NV  
 Inclusion 2: 025XY019NV  
 Inclusion 3: 025XY019NV

**2612--Dacker-Zevadez association*****Composition******Major Components***

Dacker very fine sandy loam, 0 to 2 percent slopes--55 percent  
 Zevadez very fine sandy loam, 2 to 4 percent slopes--30 percent

***Contrasting Inclusions***

Inclusion 1: Clurde very fine sandy loam, 0 to 2 percent slopes--7 percent  
 Inclusion 2: Chiara very fine sandy loam, 0 to 2 percent slopes--5 percent  
 Inclusion 3: Durixerollic Camborthids, fine-loamy over sandy or sandy-skeletal, mixed, mesic fine sandy loam, 0 to 2 percent slopes--3 percent

***Map Unit Setting***

*Landscape position:* Fan piedmonts  
 Dacker--Landform: Fan remnants; geomorphic position: summit  
 Zevadez--Landform: Fan remnants; geomorphic position: backslope  
 Inclusion 1--Landform: Inset fans; geomorphic position: footslope  
 Inclusion 2--Landform: Fan remnants; geomorphic position: summit; shape of slope: convex  
 Inclusion 3--Landform: Inset fans

***Major Component Description*****Dacker Series**

*Elevation:* 4,800 to 5,600 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Very fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

**Zevadez Series**

*Elevation:* 4,800 to 5,600 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Very fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

#### ***Dominant Present Vegetation***

Dacker: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Zevadez: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Inclusion 1: Wyoming big sagebrush, bottlebrush squirreltail

Inclusion 2: Wyoming big sagebrush

Inclusion 3: Wyoming big sagebrush

#### ***Ecological Site***

Dacker: 025XY019NV

Zevadez: 025XY019NV

Inclusion 1: 025XY019NV

Inclusion 2: 025XY019NV

Inclusion 3: 025XY019NV

### **2615--Dacker-Chiara association**

#### ***Composition***

##### ***Major Components***

Dacker very fine sandy loam, 2 to 4 percent slopes--50 percent

Chiara very fine sandy loam, 0 to 2 percent slopes--35 percent

##### ***Contrasting Inclusions***

Inclusion 1: Clurde very fine sandy loam, 0 to 2 percent slopes--5 percent

Inclusion 2: Durixerollic Camborthids, fine-loamy over sandy or sandy-skeletal, mixed, mesic fine sandy loam, 0 to 2 percent slopes--5 percent

Inclusion 3: Shalake very fine sandy loam, 0 to 2 percent slopes--4 percent

Inclusion 4: Xerollic Haplargids, fine, montmorillonitic, mesic extremely cobbly loam, 0 to 4 percent slopes--1 percent

#### ***Map Unit Setting***

*Landscape position:* Fan piedmonts

Dacker--Landform: Fan remnants; geomorphic position: backslope

Chiara--Landform: Fan remnants; geomorphic position: summit

Inclusion 1--Landform: Inset fans

Inclusion 2--Landform: Inset fans

Inclusion 3--Landform: Fan remnants; geomorphic position: summit

Inclusion 4--Landform: Fan remnants; geomorphic position: summit; shape of slope: concave

#### ***Major Component Description***

##### ***Dacker Series***

*Elevation:* 5,100 to 5,600 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Very fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

#### ***Chiara Series***

*Elevation:* 5,100 to 5,600 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 105 days

*Surface layer texture:* Very fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

#### ***Dominant Present Vegetation***

Dacker: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Chiara: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Inclusion 1: Wyoming big sagebrush, bottlebrush squirreltail

Inclusion 2: Wyoming big sagebrush

Inclusion 3: Wyoming big sagebrush

Inclusion 4: Bluebunch wheatgrass, bottlebrush squirreltail

#### ***Ecological Site***

Dacker: 025XY019NV

Chiara: 025XY019NV

Inclusion 1: 025XY019NV

Inclusion 2: 025XY019NV

Inclusion 3: 025XY019NV

Inclusion 4: 025XY050NV

### **2621--Gochea-Susie Creek-Carstump association**

#### ***Composition***

##### ***Major Components***

Gochea gravelly loam, 4 to 8 percent slopes--35 percent

Susie Creek loam, 4 to 15 percent slopes--25 percent

Carstump very cobbly loam, 15 to 30 percent slopes--25 percent

##### ***Contrasting Inclusions***

Inclusion 1: Haploxerollic Durargids, fine, montmorillonitic, frigid gravelly loam, 15 to 30 percent slopes--5 percent

Inclusion 2: Handy very cobbly loam, 15 to 30 percent slopes--5 percent

Inclusion 3: Rock outcrop--3 percent

Inclusion 4: Rubble land fragmental material--2 percent

#### ***Map Unit Setting***

*Landscape position:* Hills and intermontane basins

Gochea--Landform: Fan remnants; geomorphic position: summit



Susie Creek--Landform: Hills; geomorphic position:  
backslope

Carstump--Landform: Hills; geomorphic position:  
backslope

Inclusion 1--Landform: Hills; geomorphic position:  
backslope

Inclusion 2--Landform: Hills; geomorphic position:  
backslope; position on slope: lower part

Inclusion 3--Landform: Hills; geomorphic position:  
summit

Inclusion 4--Landform: Hills; geomorphic position:  
backslope

### ***Major Component Description***

#### **Gochea Series**

*Elevation:* 5,100 to 5,600 feet

*Precipitation:* About 12 inches

*Air temperature:* About 45 degrees

*Frost-free season:* About 90 days

*Surface layer texture:* Gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed  
rocks

#### **Susie Creek Series**

*Elevation:* 5,100 to 5,600 feet

*Precipitation:* About 11 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 90 days

*Surface layer texture:* Loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from  
tuffaceous rocks

#### **Carstump Series**

*Elevation:* 5,100 to 5,600 feet

*Precipitation:* About 11 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Very cobbly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from  
volcanic rocks

### ***Dominant Present Vegetation***

Gochea: Big sagebrush, bluegrass, bottlebrush  
squirreltail, cheatgrass

Susie Creek: Basin big sagebrush, bluebunch  
wheatgrass, bluegrass, rabbitbrush

Carstump: Big sagebrush, bluegrass, bottlebrush  
squirreltail, cheatgrass

Inclusion 1: Big sagebrush, bottlebrush squirreltail

Inclusion 2: Wyoming big sagebrush

Inclusion 3: None

Inclusion 4: None

### ***Ecological Site***

Gochea: 025XY014NV

Susie Creek: 025XY014NV

Carstump: 025XY014NV

Inclusion 1: 025XY014NV

Inclusion 2: 025XY019NV

Inclusion 3: None

Inclusion 4: None

## **2641--Olac-Snowmore association**

### ***Composition***

#### ***Major Components***

Olac very stony loam, 4 to 15 percent slopes--70  
percent

Snowmore very fine sandy loam, 2 to 4 percent slopes  
--15 percent

#### ***Contrasting Inclusions***

Inclusion 1: Coltroop very cobbly fine sandy loam, 0 to  
2 percent slopes--5 percent

Inclusion 2: Chiara very fine sandy loam, 0 to 2  
percent slopes--5 percent

Inclusion 3: Rubble land fragmental material--3 percent

Inclusion 4: Xerollic Haplargids, fine, montmorillonitic,  
mesic extremely cobbly loam, 0 to 4 percent slopes  
--2 percent

### ***Map Unit Setting***

*Landscape position:* Hills

Olac--Landform: Hills; geomorphic position: footslope

Snowmore--Landform: Hills; geomorphic position:  
summit

Inclusion 1--Landform: Hills; geomorphic position:  
shoulder

Inclusion 2--Landform: Hills; geomorphic position:  
summit

Inclusion 3--Landform: Hills; geomorphic position:  
backslope

Inclusion 4--Landform: Drainageways

### ***Major Component Description***

#### **Olac Series**

*Elevation:* 5,300 to 5,500 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Very stony loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from  
volcanic rocks

#### **Snowmore Series**

*Elevation:* 5,300 to 5,500 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Very fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from  
volcanic rocks

### ***Dominant Present Vegetation***

Olac: Bluebunch wheatgrass, bluegrass, bottlebrush  
squirreltail, low sagebrush

Snowmore: Wyoming big sagebrush, bluegrass,  
bottlebrush squirreltail, cheatgrass  
Inclusion 1: Wyoming big sagebrush, bottlebrush  
squirreltail  
Inclusion 2: Wyoming big sagebrush  
Inclusion 3: None  
Inclusion 4: Bluebunch wheatgrass

#### ***Ecological Site***

Olac: 025XY018NV  
Snowmore: 025XY019NV  
Inclusion 1: 025XY019NV  
Inclusion 2: 025XY019NV  
Inclusion 3: None  
Inclusion 4: 025XY050NV

### **2650--Wieland-Bartome-Zevadez association**

#### ***Composition***

##### ***Major Components***

Wieland gravelly loam, 8 to 15 percent slopes--45  
percent  
Bartome very fine sandy loam, 0 to 2 percent slopes--  
25 percent  
Zevadez very fine sandy loam, 4 to 8 percent slopes--  
20 percent

##### ***Contrasting Inclusions***

Inclusion 1: Dacker very fine sandy loam, 2 to 4  
percent slopes--7 percent  
Inclusion 2: Haploxerollic Durargids, fine-loamy, mixed,  
mesic gravelly loam, 2 to 4 percent slopes--3  
percent

#### ***Map Unit Setting***

*Landscape position:* Fan piedmonts  
Wieland--Landform: Fan remnants; geomorphic  
position: backslope  
Bartome--Landform: Fan remnants; geomorphic  
position: summit  
Zevadez--Landform: Fan remnants; geomorphic  
position: footslope  
Inclusion 1--Landform: Fan remnants; geomorphic  
position: toeslope  
Inclusion 2--Landform: Fan remnants; geomorphic  
position: shoulder; shape of slope: convex

#### ***Major Component Description***

##### ***Wieland Series***

*Elevation:* 4,800 to 5,500 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed  
rocks, loess and volcanic ash

##### ***Bartome Series***

*Elevation:* 4,800 to 5,500 feet  
*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees  
*Frost-free season:* About 105 days  
*Surface layer texture:* Very fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed  
rocks, loess and volcanic ash

##### ***Zevadez Series***

*Elevation:* 4,800 to 5,500 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Very fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed  
rocks, loess and volcanic ash

#### ***Dominant Present Vegetation***

Wieland: Wyoming big sagebrush, bluegrass,  
bottlebrush squirreltail, cheatgrass  
Bartome: Bluegrass, cheatgrass  
Zevadez: Wyoming big sagebrush, bluegrass,  
bottlebrush squirreltail, cheatgrass  
Inclusion 1: Wyoming big sagebrush, bottlebrush  
squirreltail  
Inclusion 2: Wyoming big sagebrush

#### ***Ecological Site***

Wieland: 025XY019NV  
Bartome: 025XY019NV  
Zevadez: 025XY019NV  
Inclusion 1: 025XY019NV  
Inclusion 2: 025XY019NV

### **2651--Wieland-Buffaran association**

#### ***Composition***

##### ***Major Components***

Wieland loam, 8 to 15 percent slopes--45 percent  
Buffaran very fine sandy loam, 0 to 2 percent slopes--  
40 percent

##### ***Contrasting Inclusions***

Inclusion 1: Zevadez very fine sandy loam, 2 to 8  
percent slopes--5 percent  
Inclusion 2: Haploxerollic Durargids, fine,  
montmorillonitic, mesic gravelly loam, 2 to 4  
percent slopes--5 percent  
Inclusion 3: Puett gravelly loam, 4 to 15 percent  
slopes--3 percent  
Inclusion 4: Rock outcrop--2 percent

#### ***Map Unit Setting***

*Landscape position:* Fan piedmonts  
Wieland--Landform: Fan remnants; geomorphic  
position: backslope  
Buffaran--Landform: Fan remnants; geomorphic  
position: summit  
Inclusion 1--Landform: Fan remnants; geomorphic  
position: toeslope



Inclusion 2--Landform: Fan remnants; geomorphic position: shoulder; shape of slope: convex

Inclusion 3--Landform: Fan remnants; geomorphic position: backslope; position on slope: upper; shape of slope: convex

Inclusion 4--Landform: Pediments; geomorphic position: backslope

### ***Major Component Description***

#### **Wieland Series**

*Elevation:* 5,000 to 5,500 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

#### **Buffaran Series**

*Elevation:* 5,000 to 5,500 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Very fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

### ***Dominant Present Vegetation***

Wieland: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Buffaran: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Inclusion 1: Wyoming big sagebrush, bottlebrush squirreltail

Inclusion 2: Wyoming big sagebrush

Inclusion 3: Wyoming big sagebrush

Inclusion 4: None

### ***Ecological Site***

Wieland: 025XY019NV

Buffaran: 025XY019NV

Inclusion 1: 025XY019NV

Inclusion 2: 025XY019NV

Inclusion 3: 025XY025NV

Inclusion 4: None

## **2652--Wieland-Dacker-Zevadez association**

### ***Composition***

#### ***Major Components***

Wieland loam, 2 to 4 percent slopes--30 percent

Dacker silt loam, 2 to 4 percent slopes--30 percent

Zevadez very fine sandy loam, 2 to 4 percent slopes--25 percent

#### ***Contrasting Inclusions***

Inclusion 1: Hunnonton silt loam, 4 to 8 percent slopes--6 percent

Inclusion 2: Olac cobbly loam, 4 to 8 percent slopes--4 percent

Inclusion 3: Aridic Haploxerolls, fine-silty, mixed, mesic silt loam, 0 to 2 percent slopes--3 percent

Inclusion 4: Buffaran very fine sandy loam, 0 to 2 percent slopes--2 percent

### ***Map Unit Setting***

*Landscape position:* Fan piedmonts

Wieland--Landform: Fan remnants; geomorphic position: toeslope

Dacker--Landform: Fan remnants; geomorphic position: summit

Zevadez--Landform: Fan remnants; geomorphic position: summit; position on slope: lower part

Inclusion 1--Landform: Fan remnants; geomorphic position: backslope

Inclusion 2--Landform: Fan remnants; geomorphic position: footslope; shape of slope: concave

Inclusion 3--Landform: Inset fans

Inclusion 4--Landform: Fan remnants; geomorphic position: summit

### ***Major Component Description***

#### **Wieland Series**

*Elevation:* 5,200 to 5,400 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

#### **Dacker Series**

*Elevation:* 5,200 to 5,400 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Silt loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

#### **Zevadez Series**

*Elevation:* 5,200 to 5,400 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Very fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

### ***Dominant Present Vegetation***

Wieland: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Dacker: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Zevadez: Wyoming big sagebrush, bottlebrush squirreltail, cheatgrass

Inclusion 1: Wyoming big sagebrush, bottlebrush squirreltail

Inclusion 2: Low sagebrush

Inclusion 3: Big sagebrush

Inclusion 4: Wyoming big sagebrush

#### ***Ecological Site***

Wieland: 025XY019NV

Dacker: 025XY019NV

Zevadez: 025XY019NV

Inclusion 1: 025XY019NV

Inclusion 2: 025XY018NV

Inclusion 3: 025XY014NV

Inclusion 4: 025XY019NV

### **2655--Wieland-Gumble-Bilbo association**

#### ***Composition***

##### ***Major Components***

Wieland loam, 4 to 15 percent slopes--40 percent

Gumble gravelly sandy loam, 15 to 30 percent slopes--25 percent

Bilbo gravelly loam, 4 to 15 percent slopes--20 percent

##### ***Contrasting Inclusions***

Inclusion 1: Hunnonton loam, 2 to 8 percent slopes--10 percent

Inclusion 2: Gumble very gravelly sandy loam, 30 to 50 percent slopes--2 percent

Inclusion 3: Durargidic Argixerolls, fine-loamy, mixed, mesic gravelly loam, 15 to 30 percent slopes--2 percent

Inclusion 4: Aridic Argixerolls, fine-loamy, mixed, mesic gravelly loam, 15 to 50 percent slopes--1 percent

#### ***Map Unit Setting***

*Landscape position:* Fan piedmonts

Wieland--Landform: Fan remnants; geomorphic position: summit

Gumble--Landform: Fan remnants; geomorphic position: backslope

Bilbo--Landform: Fan remnants; geomorphic position: summit

Inclusion 1--Landform: Fan remnants; geomorphic position: summit

Inclusion 2--Landform: Fan remnants; geomorphic position: backslope; aspect: south

Inclusion 3--Landform: Fan remnants; geomorphic position: backslope

Inclusion 4--Landform: Fan remnants; geomorphic position: backslope

#### ***Major Component Description***

##### ***Wieland Series***

*Elevation:* 5,200 to 5,600 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

##### ***Gumble Series***

*Elevation:* 5,200 to 5,600 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Gravelly sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from tuffaceous rocks

##### ***Bilbo Series***

*Elevation:* 5,200 to 5,600 feet

*Precipitation:* About 10 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

#### ***Dominant Present Vegetation***

Wieland: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Gumble: Wyoming big sagebrush, bluebunch wheatgrass

Bilbo: Wyoming big sagebrush, bluebunch wheatgrass

Inclusion 1: Wyoming big sagebrush, bottlebrush squirreltail

Inclusion 2: Big sagebrush, cheatgrass

Inclusion 3: Basin big sagebrush

Inclusion 4: Big sagebrush

#### ***Ecological Site***

Wieland: 025XY019NV

Gumble: 025XY019NV

Bilbo: 025XY019NV

Inclusion 1: 025XY019NV

Inclusion 2: 025XY015NV

Inclusion 3: 025XY027NV

Inclusion 4: 025XY014NV

### **2656--Wieland-Hunnonton-Thwoop association**

#### ***Composition***

##### ***Major Components***

Wieland loam, 2 to 4 percent slopes--35 percent

Hunnonton silt loam, 2 to 4 percent slopes--30 percent

Thwoop gravelly silt loam, 4 to 8 percent slopes--20 percent

##### ***Contrasting Inclusions***

Inclusion 1: Vanwyper gravelly loam, 4 to 15 percent slopes--5 percent

Inclusion 2: Xerollic Haplargids, fine, montmorillonitic, mesic gravelly loam, 2 to 8 percent slopes--5 percent



Inclusion 3: Pachic Haploxerolls, loamy-skeletal, mixed, mesic very gravelly loam, 4 to 8 percent slopes--3 percent

Inclusion 4: Xerollic Camborthids, fine-loamy, mixed, mesic gravelly loam, 0 to 4 percent slopes--2 percent

### ***Map Unit Setting***

*Landscape position:* Hills and intermontane basins

Wieland--Landform: Fan remnants; geomorphic position: summit

Hunnton--Landform: Fan remnants; geomorphic position: summit

Thwoop--Landform: Fan remnants; geomorphic position: backslope; aspect: north

Inclusion 1--Landform: Hills

Inclusion 2--Landform: Hills; geomorphic position: backslope; shape of slope: concave

Inclusion 3--Landform: Hills; position on slope: upper; shape of slope: concave

Inclusion 4--Landform: Inset fans

### ***Major Component Description***

#### **Wieland Series**

*Elevation:* 5,100 to 5,400 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

#### **Hunnton Series**

*Elevation:* 5,100 to 5,400 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Silt loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

#### **Thwoop Series**

*Elevation:* 5,100 to 5,400 feet

*Precipitation:* About 11 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Gravelly silt loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

### ***Dominant Present Vegetation***

Wieland: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Hunnton: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Thwoop: Thurber needlegrass, basin wildrye, big sagebrush, bluegrass

Inclusion 1: Wyoming big sagebrush, bottlebrush squirreltail

Inclusion 2: Wyoming big sagebrush, bottlebrush squirreltail

Inclusion 3: Basin big sagebrush

Inclusion 4: Wyoming big sagebrush

### ***Ecological Site***

Wieland: 025XY019NV

Hunnton: 025XY019NV

Thwoop: 025XY014NV

Inclusion 1: 025XY019NV

Inclusion 2: 025XY019NV

Inclusion 3: 025XY003NV

Inclusion 4: 025XY019NV

## **2658--Wieland very gravelly loam, 15 to 30 percent slopes**

### ***Composition***

#### ***Major Components***

Wieland very gravelly loam, 15 to 30 percent slopes--85 percent

#### ***Contrasting Inclusions***

Inclusion 1: Durixerollic Camborthids, loamy-skeletal, mixed, mesic fine sandy loam, 8 to 15 percent slopes--5 percent

Inclusion 2: Zevadez very fine sandy loam, 0 to 2 percent slopes--5 percent

Inclusion 3: Durixerollic Haplargids, fine, montmorillonitic, mesic very gravelly loam, 8 to 15 percent slopes--5 percent

### ***Map Unit Setting***

*Landscape position:* Fan piedmonts

Wieland--Landform: Fan remnants; geomorphic position: backslope

Inclusion 1--Landform: Fan remnants; geomorphic position: toeslope

Inclusion 2--Landform: Fan remnants; geomorphic position: summit

Inclusion 3--Landform: Fan remnants; geomorphic position: shoulder

### ***Major Component Description***

#### **Wieland Series**

*Elevation:* 4,800 to 5,400 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Very gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

### ***Dominant Present Vegetation***

Wieland: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Inclusion 1: Wyoming big sagebrush, bottlebrush squirreltail

Inclusion 2: Wyoming big sagebrush, bottlebrush squirreltail

Inclusion 3: Wyoming big sagebrush

#### ***Ecological Site***

Wieland: 025XY019NV

Inclusion 1: 025XY019NV

Inclusion 2: 025XY019NV

Inclusion 3: 025XY019NV

### **2666--Puett-Orovada association**

#### ***Composition***

##### ***Major Components***

Puett fine sandy loam, 15 to 30 percent slopes--65 percent

Orovada very fine sandy loam, 4 to 15 percent slopes--25 percent

##### ***Contrasting Inclusions***

Inclusion 1: Orovada loam, 0 to 2 percent slopes--10 percent

#### ***Map Unit Setting***

*Landscape position:* Fan piedmonts

Puett--Landform: Fan remnants; geomorphic position: backslope

Orovada--Landform: Fan remnants; geomorphic position: toeslope

Inclusion 1--Landform: Inset fans

#### ***Major Component Description***

##### ***Puett Series***

*Elevation:* 5,000 to 6,000 feet

*Precipitation:* About 9 inches

*Air temperature:* About 48 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from tuffaceous rocks

##### ***Orovada Series***

*Elevation:* 5,000 to 6,000 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Very fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

#### ***Dominant Present Vegetation***

Puett: Wyoming big sagebrush, bluegrass, rabbitbrush

Orovada: Thurber needleglass, Wyoming big sagebrush

Inclusion 1: Wyoming big sagebrush, bottlebrush squirreltail

#### ***Ecological Site***

Puett: 025XY025NV

Orovada: 024XY020NV

Inclusion 1: 024XY005NV

### **2667--Puett-Rock outcrop-Clurde association**

#### ***Composition***

##### ***Major Components***

Puett gravelly loam, 30 to 50 percent slopes--50 percent

Rock outcrop--20 percent

Clurde very fine sandy loam, 4 to 8 percent slopes--15 percent

##### ***Contrasting Inclusions***

Inclusion 1: Chiara very fine sandy loam, 8 to 15 percent slopes--5 percent

Inclusion 2: Alley gravelly loam, 8 to 15 percent slopes--5 percent

Inclusion 3: Yuko sandy loam, 15 to 30 percent slopes--5 percent

#### ***Map Unit Setting***

*Landscape position:* Hills and intermontane basins

Puett--Landform: Hills; geomorphic position: backslope; position on slope: upper part

Rock outcrop--Landform: Hills; geomorphic position: summit

Clurde--Landform: Fan remnants; geomorphic position: backslope

Inclusion 1--Landform: Fan remnants; geomorphic position: summit

Inclusion 2--Landform: Fan remnants; geomorphic position: footslope

Inclusion 3--Landform: Hills; geomorphic position: backslope; position on slope: lower; aspect: south

#### ***Major Component Description***

##### ***Puett Series***

*Elevation:* 5,100 to 5,700 feet

*Precipitation:* About 9 inches

*Air temperature:* About 48 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from tuffaceous rocks

##### ***Rock outcrop Miscellaneous Area***

*Elevation:* 5,100 to 5,700 feet

*Drainage class:* Excessively drained

##### ***Clurde Series***

*Elevation:* 5,100 to 5,700 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Very fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from volcanic rocks, loess and volcanic ash



***Dominant Present Vegetation***

Puett: Wyoming big sagebrush, bluegrass, rabbitbrush  
Rock outcrop: None

Clurde: Wyoming big sagebrush, bluegrass, bottlebrush  
squirreltail, cheatgrass

Inclusion 1: Wyoming big sagebrush, bottlebrush  
squirreltail

Inclusion 2: Wyoming big sagebrush, bottlebrush  
squirreltail

Inclusion 3: Wyoming big sagebrush

***Ecological Site***

Puett: 025XY025NV

Clurde: 025XY019NV

Rock outcrop: None

Inclusion 1: 025XY019NV

Inclusion 2: 025XY019NV

Inclusion 3: 025XY019NV

**2668--Puett-Yuko-Zevadez association*****Composition******Major Components***

Puett gravelly loam, 30 to 50 percent slopes--45  
percent

Yuko sandy loam, 15 to 30 percent slopes--25 percent

Zevadez very fine sandy loam, 4 to 8 percent slopes--  
15 percent

***Contrasting Inclusions***

Inclusion 1: Chime gravelly loam, 8 to 15 percent  
slopes--5 percent

Inclusion 2: Xeric Torriorthents, loamy-skeletal, mixed,  
nonacid, mesic gravelly loam, 30 to 50 percent  
slopes--5 percent

Inclusion 3: Rock outcrop--3 percent

Inclusion 4: Chiara very fine sandy loam, 2 to 4  
percent slopes--2 percent

***Map Unit Setting***

*Landscape position:* Fan piedmonts

Puett--Landform: Fan remnants; geomorphic position:  
backslope; position on slope: upper part

Yuko--Landform: Fan remnants; geomorphic position:  
backslope; position on slope: lower part

Zevadez--Landform: Fan remnants; geomorphic  
position: footslope

Inclusion 1--Landform: Fan remnants; geomorphic  
position: footslope

Inclusion 2--Landform: Fan remnants; geomorphic  
position: backslope

Inclusion 3--Landform: Fan remnants; geomorphic  
position: backslope

Inclusion 4--Landform: Fan remnants; geomorphic  
position: shoulder

***Major Component Description******Puett Series***

*Elevation:* 5,100 to 5,600 feet

*Precipitation:* About 9 inches

*Air temperature:* About 48 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium  
derived from tuffaceous rocks

***Yuko Series***

*Elevation:* 5,100 to 5,600 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium  
derived from tuffaceous rocks

***Zevadez Series***

*Elevation:* 5,100 to 5,600 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Very fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed  
rocks, loess and volcanic ash

***Dominant Present Vegetation***

Puett: Wyoming big sagebrush, bluegrass, rabbitbrush

Yuko: Wyoming big sagebrush, bluegrass, bottlebrush  
squirreltail, cheatgrass

Zevadez: Wyoming big sagebrush, bluegrass,  
bottlebrush squirreltail, cheatgrass

Inclusion 1: Wyoming big sagebrush, bottlebrush  
squirreltail

Inclusion 2: Wyoming big sagebrush, bottlebrush  
squirreltail

Inclusion 3: None

Inclusion 4: Wyoming big sagebrush

***Ecological Site***

Puett: 025XY025NV

Yuko: 025XY019NV

Zevadez: 025XY019NV

Inclusion 1: 025XY019NV

Inclusion 2: 025XY019NV

Inclusion 3: None

Inclusion 4: 025XY019NV

**2710--Ramires-Bartome-Bilbo association*****Composition******Major Components***

Ramires silt loam, 8 to 15 percent slopes--35 percent

Bartome very fine sandy loam, 2 to 4 percent slopes--  
30 percent

Bilbo very gravelly very fine sandy loam, 15 to 30  
percent slopes--20 percent

***Contrasting Inclusions***

Inclusion 1: Buffaran very fine sandy loam, 0 to 2  
percent slopes--5 percent

Inclusion 2: Alyan very gravelly loam, 15 to 30 percent slopes--5 percent

Inclusion 3: Clurde very fine sandy loam, 0 to 2 percent slopes--5 percent

### ***Map Unit Setting***

*Landscape position:* Hills and intermontane basins

Ramires--Landform: Pediments; geomorphic position: backslope; aspect: north

Bartome--Landform: Fan remnants; geomorphic position: summit

Bilbo--Landform: Fan remnants; geomorphic position: backslope; aspect: south

Inclusion 1--Landform: Hills; geomorphic position: summit

Inclusion 2--Landform: Hills; geomorphic position: backslope; shape of slope: convex

Inclusion 3--Landform: Inset fans

### ***Major Component Description***

#### **Ramires Series**

*Elevation:* 5,100 to 6,000 feet

*Precipitation:* About 11 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Silt loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from tuffaceous rocks

#### **Bartome Series**

*Elevation:* 5,100 to 6,000 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 105 days

*Surface layer texture:* Very fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

#### **Bilbo Series**

*Elevation:* 5,100 to 6,000 feet

*Precipitation:* About 10 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Very gravelly very fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

### ***Dominant Present Vegetation***

Ramires: Basin wildrye, big sagebrush, bluebunch wheatgrass, rabbitbrush

Bartome: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Bilbo: Big sagebrush, bluebunch wheatgrass, cheatgrass

Inclusion 1: Wyoming big sagebrush, bottlebrush squirreltail

Inclusion 2: Big sagebrush, bottlebrush squirreltail

Inclusion 3: Wyoming big sagebrush

### ***Ecological Site***

Ramires: 025XY014NV

Bartome: 025XY019NV

Bilbo: 025XY015NV

Inclusion 1: 025XY019NV

Inclusion 2: 025XY014NV

Inclusion 3: 025XY019NV

## **2711--Ramires-Bilbo-Bufferan association**

### ***Composition***

#### ***Major Components***

Ramires silt loam, 8 to 15 percent slopes--35 percent

Bilbo very gravelly very fine sandy loam, 30 to 50 percent slopes--30 percent

Bufferan very fine sandy loam, 2 to 8 percent slopes--20 percent

#### ***Contrasting Inclusions***

Inclusion 1: Alyan very gravelly loam, 30 to 50 percent slopes--5 percent

Inclusion 2: Hatpeak loam, 8 to 15 percent slopes--5 percent

Inclusion 3: Bartome very fine sandy loam, 2 to 4 percent slopes--5 percent

### ***Map Unit Setting***

*Landscape position:* Fan piedmonts

Ramires--Landform: Pediments; geomorphic position: backslope; position on slope: lower; aspect: north

Bilbo--Landform: Fan remnants; geomorphic position: backslope; position on slope: upper; aspect: south

Bufferan--Landform: Fan remnants; geomorphic position: summit

Inclusion 1--Landform: Hills; geomorphic position: backslope; position on slope: upper part

Inclusion 2--Landform: Hills; geomorphic position: footslope

Inclusion 3--Landform: Hills; geomorphic position: shoulder

### ***Major Component Description***

#### **Ramires Series**

*Elevation:* 5,700 to 6,000 feet

*Precipitation:* About 11 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Silt loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from tuffaceous rocks

#### **Bilbo Series**

*Elevation:* 5,700 to 6,000 feet

*Precipitation:* About 10 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Very gravelly very fine sandy loam



*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

#### **Buffaran Series**

*Elevation:* 5,700 to 6,000 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Very fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

#### ***Dominant Present Vegetation***

Ramires: Basin wildrye, big sagebrush, bluebunch wheatgrass, rabbitbrush

Bilbo: Thurber needlegrass, big sagebrush, bluebunch wheatgrass

Buffaran: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Inclusion 1: Big sagebrush, bottlebrush squirreltail

Inclusion 2: Idaho fescue, basin big sagebrush

Inclusion 3: Wyoming big sagebrush

#### ***Ecological Site***

Ramires: 025XY014NV

Bilbo: 025XY015NV

Buffaran: 025XY019NV

Inclusion 1: 025XY014NV

Inclusion 2: 025XY027NV

Inclusion 3: 025XY019NV

### **2741--Wilsor-Wilsor, moderately steep association**

#### ***Composition***

#### ***Major Components***

Wilsor loam, 4 to 15 percent slopes--55 percent

Wilsor loam, 15 to 30 percent slopes--30 percent

#### ***Contrasting Inclusions***

Inclusion 1: Xeric Torriorthents, loamy, mixed, nonacid, frigid, shallow gravelly loam, 15 to 30 percent slopes--10 percent

Inclusion 2: Ratsow loam, 4 to 15 percent slopes--3 percent

Inclusion 3: Rock outcrop--2 percent

#### ***Map Unit Setting***

*Landscape position:* Hills

Wilsor--Landform: Hills; geomorphic position: summit

Wilsor--Landform: Hills; geomorphic position: shoulder

Inclusion 1--Landform: Hills; geomorphic position: summit

Inclusion 2--Landform: Hills; geomorphic position: backslope

Inclusion 3--Landform: Hills; geomorphic position: backslope

#### ***Major Component Description***

#### **Wilsor Series**

*Elevation:* 5,600 to 5,800 feet

*Precipitation:* About 11 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from tuffaceous rocks

#### **Wilsor Series**

*Elevation:* 5,600 to 5,800 feet

*Precipitation:* About 11 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from tuffaceous rocks

#### ***Dominant Present Vegetation***

Wilsor: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Wilsor: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Inclusion 1: Indian ricegrass, Wyoming big sagebrush

Inclusion 2: Big sagebrush, bottlebrush squirreltail

Inclusion 3: None

#### ***Ecological Site***

Wilsor: 025XY019NV

Wilsor: 025XY019NV

Inclusion 1: 025XY025NV

Inclusion 2: 025XY014NV

Inclusion 3: None

### **2751--Yuko-Chime-Clurde association**

#### ***Composition***

#### ***Major Components***

Yuko sandy loam, 8 to 15 percent slopes--35 percent

Chime gravelly loam, 8 to 15 percent slopes--30 percent

Clurde very fine sandy loam, 2 to 4 percent slopes--20 percent

#### ***Contrasting Inclusions***

Inclusion 1: Zevadez very fine sandy loam, 0 to 2 percent slopes--5 percent

Inclusion 2: Chiara very fine sandy loam, 0 to 2 percent slopes--4 percent

Inclusion 3: Durixerollic Haplargids, fine, montmorillonitic, mesic gravelly loam, 8 to 15 percent slopes--3 percent

Inclusion 4: Zevadez gravelly loam, 4 to 8 percent slopes--3 percent

#### ***Map Unit Setting***

*Landscape position:* Fan piedmonts

Yuko--Landform: Pediments; geomorphic position: backslope  
 Chime--Landform: Pediments; geomorphic position: backslope  
 Clurde--Landform: Fan remnants; geomorphic position: footslope  
 Inclusion 1--Landform: Fan remnants; geomorphic position: summit  
 Inclusion 2--Landform: Fan remnants; geomorphic position: summit  
 Inclusion 3--Landform: Fan remnants; geomorphic position: backslope  
 Inclusion 4--Landform: Fan remnants; geomorphic position: backslope; shape of slope: concave

### ***Major Component Description***

#### **Yuko Series**

*Elevation:* 5,200 to 5,600 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from tuffaceous rocks

#### **Chime Series**

*Elevation:* 5,200 to 5,600 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 105 days  
*Surface layer texture:* Gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum derived from sedimentary rocks

#### **Clurde Series**

*Elevation:* 5,200 to 5,600 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Very fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from volcanic rocks, loess and volcanic ash

### ***Dominant Present Vegetation***

Yuko: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass  
 Chime: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass  
 Clurde: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass  
 Inclusion 1: Wyoming big sagebrush, bottlebrush squirreltail  
 Inclusion 2: Wyoming big sagebrush, bottlebrush squirreltail  
 Inclusion 3: Wyoming big sagebrush  
 Inclusion 4: Wyoming big sagebrush

### ***Ecological Site***

Yuko: 025XY019NV  
 Chime: 025XY019NV  
 Clurde: 025XY019NV  
 Inclusion 1: 025XY019NV  
 Inclusion 2: 025XY019NV  
 Inclusion 3: 025XY019NV  
 Inclusion 4: 025XY019NV

## **2775--Zevadez-Bartome-Wieland association**

### ***Composition***

#### ***Major Components***

Zevadez very fine sandy loam, 2 to 8 percent slopes--35 percent  
 Bartome very fine sandy loam, 2 to 4 percent slopes--30 percent  
 Wieland loam, 2 to 4 percent slopes--20 percent

#### ***Contrasting Inclusions***

Inclusion 1: Buffaran very fine sandy loam, 0 to 2 percent slopes--5 percent  
 Inclusion 2: Kelk very fine sandy loam, 0 to 2 percent slopes--5 percent  
 Inclusion 3: Haploxerollic Durargids, fine, montmorillonitic, mesic gravelly loam, 2 to 4 percent slopes--5 percent

### ***Map Unit Setting***

*Landscape position:* Fan piedmonts  
 Zevadez--Landform: Fan remnants; geomorphic position: backslope  
 Bartome--Landform: Fan remnants; geomorphic position: summit; shape of slope: convex  
 Wieland--Landform: Fan remnants; geomorphic position: toeslope; shape of slope: concave  
 Inclusion 1--Landform: Fan remnants; geomorphic position: summit  
 Inclusion 2--Landform: Inset fans  
 Inclusion 3--Landform: Fan remnants; geomorphic position: shoulder; shape of slope: convex

### ***Major Component Description***

#### **Zevadez Series**

*Elevation:* 4,800 to 5,600 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Very fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

#### **Bartome Series**

*Elevation:* 4,800 to 5,600 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 105 days  
*Surface layer texture:* Very fine sandy loam  
*Drainage class:* Well drained



*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

#### **Wieland Series**

*Elevation:* 4,800 to 5,600 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

#### **Dominant Present Vegetation**

Zevadez: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Bartome: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Wieland: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Inclusion 1: Wyoming big sagebrush, bottlebrush squirreltail

Inclusion 2: Wyoming big sagebrush, bottlebrush squirreltail

Inclusion 3: Wyoming big sagebrush

#### **Ecological Site**

Zevadez: 025XY019NV

Bartome: 025XY019NV

Wieland: 025XY019NV

Inclusion 1: 025XY019NV

Inclusion 2: 025XY019NV

Inclusion 3: 025XY019NV

### **2776--Zevadez-Chiara association**

#### **Composition**

##### **Major Components**

Zevadez very fine sandy loam, 0 to 2 percent slopes--45 percent

Chiara very fine sandy loam, 2 to 4 percent slopes--40 percent

##### **Contrasting Inclusions**

Inclusion 1: Durixerollic Camborthids, fine-loamy over sandy or sandy-skeletal, mixed, mesic fine sandy loam, 0 to 4 percent slopes--5 percent

Inclusion 2: Buffaran very fine sandy loam, 0 to 2 percent slopes--4 percent

Inclusion 3: Dacker very fine sandy loam, 2 to 4 percent slopes--4 percent

Inclusion 4: Wieland very fine sandy loam, 2 to 4 percent slopes--2 percent

#### **Map Unit Setting**

*Landscape position:* Fan piedmonts

Zevadez--Landform: Fan remnants; geomorphic position: summit

Chiara--Landform: Fan remnants; geomorphic position: backslope; position on slope: upper part

Inclusion 1--Landform: Inset fans

Inclusion 2--Landform: Fan remnants; geomorphic position: summit

Inclusion 3--Landform: Fan remnants; geomorphic position: backslope; position on slope: lower part

Inclusion 4--Landform: Fan remnants; geomorphic position: toeslope

#### **Major Component Description**

##### **Zevadez Series**

*Elevation:* 5,100 to 5,600 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Very fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

##### **Chiara Series**

*Elevation:* 5,100 to 5,600 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 105 days

*Surface layer texture:* Very fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

#### **Dominant Present Vegetation**

Zevadez: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Chiara: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Inclusion 1: Wyoming big sagebrush, bottlebrush squirreltail

Inclusion 2: Wyoming big sagebrush, bottlebrush squirreltail

Inclusion 3: Wyoming big sagebrush

Inclusion 4: Wyoming big sagebrush

#### **Ecological Site**

Zevadez: 025XY019NV

Chiara: 025XY019NV

Inclusion 1: 025XY019NV

Inclusion 2: 025XY019NV

Inclusion 3: 025XY019NV

Inclusion 4: 025XY019NV

### **2777--Zevadez-Wieland-Clurde association**

#### **Composition**

##### **Major Components**

Zevadez very fine sandy loam, 0 to 2 percent slopes--45 percent

Wieland loam, 0 to 2 percent slopes--25 percent

Clurde very fine sandy loam, 0 to 2 percent slopes--15 percent

##### **Contrasting Inclusions**

Inclusion 1: McCleary sandy loam, 0 to 2 percent slopes, occasionally flooded--5 percent

Inclusion 2: Durixerollic Camborthids, fine-loamy over sandy or sandy-skeletal, mixed, mesic fine sandy loam, 0 to 2 percent slopes--5 percent

Inclusion 3: McCleary very fine sandy loam, overwash, 0 to 2 percent slopes, occasionally flooded--5 percent

### **Map Unit Setting**

*Landscape position:* Hills and intermontane basins  
Zevadez--Landform: Fan remnants; geomorphic position: summit

Wieland--Landform: Fan remnants; geomorphic position: summit; shape of slope: concave

Clurde--Landform: Fan remnants; geomorphic position: backslope

Inclusion 1--Landform: Hills; geomorphic position: summit

Inclusion 2--Landform: Lake plains

Inclusion 3--Landform: Inset fans

### **Major Component Description**

#### **Zevadez Series**

*Elevation:* 5,100 to 5,500 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Very fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

#### **Wieland Series**

*Elevation:* 5,100 to 5,500 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

#### **Clurde Series**

*Elevation:* 5,100 to 5,500 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Very fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from volcanic rocks, loess and volcanic ash

### **Dominant Present Vegetation**

Zevadez: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Wieland: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Clurde: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Inclusion 1: Mat muhly, silver sagebrush

Inclusion 2: Wyoming big sagebrush, bottlebrush squirreltail

Inclusion 3: Silver sagebrush

### **Ecological Site**

Zevadez: 025XY019NV

Wieland: 025XY019NV

Clurde: 025XY019NV

Inclusion 1: 025XY048NV

Inclusion 2: 025XY019NV

Inclusion 3: 025XY048NV

## **2778--Zevadez-Yuko-Kelk association**

### **Composition**

#### **Major Components**

Zevadez very fine sandy loam, 0 to 2 percent slopes--45 percent

Yuko sandy loam, 4 to 15 percent slopes--25 percent

Kelk very fine sandy loam, 0 to 2 percent slopes--15 percent

#### **Contrasting Inclusions**

Inclusion 1: Chime gravelly loam, 4 to 15 percent slopes--7 percent

Inclusion 2: Clurde very fine sandy loam, 0 to 2 percent slopes--3 percent

Inclusion 3: Durixerollic Camborthids, fine-loamy over sandy or sandy-skeletal, mixed, mesic fine sandy loam, 0 to 2 percent slopes--3 percent

Inclusion 4: Chiara very fine sandy loam, 0 to 2 percent slopes--2 percent

### **Map Unit Setting**

*Landscape position:* Hills and intermontane basins

Zevadez--Landform: Fan remnants; geomorphic position: summit

Yuko--Landform: Pediments; geomorphic position: shoulder; aspect: south

Kelk--Landform: Inset fans

Inclusion 1--Landform: Hills; geomorphic position: backslope

Inclusion 2--Landform: Hills; geomorphic position: footslope

Inclusion 3--Landform: Inset fans

Inclusion 4--Landform: Fan remnants; geomorphic position: summit

### **Major Component Description**

#### **Zevadez Series**

*Elevation:* 5,100 to 5,600 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Very fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

#### **Yuko Series**

*Elevation:* 5,100 to 5,600 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees



*Frost-free season:* About 110 days  
*Surface layer texture:* Sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from tuffaceous rocks

#### **Kelk Series**

*Elevation:* 5,100 to 5,500 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Very fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

#### ***Dominant Present Vegetation***

Zevadez: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass  
 Yuko: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass  
 Kelk: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass  
 Inclusion 1: Wyoming big sagebrush, bottlebrush squirreltail, cheatgrass  
 Inclusion 2: Wyoming big sagebrush, bottlebrush squirreltail, cheatgrass  
 Inclusion 3: Wyoming big sagebrush, bottlebrush squirreltail  
 Inclusion 4: Wyoming big sagebrush, bottlebrush squirreltail

#### ***Ecological Site***

Zevadez: 025XY019NV  
 Yuko: 025XY019NV  
 Kelk: 025XY019NV  
 Inclusion 1: 025XY019NV  
 Inclusion 2: 025XY019NV  
 Inclusion 3: 025XY019NV  
 Inclusion 4: 025XY019NV

### **2780--Snowmore, cobbly-Snowmore association**

#### ***Composition***

#### ***Major Components***

Snowmore cobbly fine sandy loam, 2 to 4 percent slopes--60 percent  
 Snowmore very fine sandy loam, 0 to 2 percent slopes--25 percent

#### ***Contrasting Inclusions***

Inclusion 1: Coltroop very fine sandy loam, 0 to 2 percent slopes--5 percent  
 Inclusion 2: Troughs cobbly loam, 4 to 8 percent slopes--5 percent

Inclusion 3: Olac gravelly loam, 4 to 15 percent slopes--3 percent

Inclusion 4: Rock outcrop--2 percent

#### ***Map Unit Setting***

*Landscape position:* Plateaus  
 Snowmore--Landform: Plateaus; geomorphic position: backslope  
 Snowmore--Landform: Plateaus; geomorphic position: summit  
 Inclusion 1--Landform: Plateaus; geomorphic position: summit  
 Inclusion 2--Landform: Plateaus; geomorphic position: backslope  
 Inclusion 3--Landform: Plateaus; geomorphic position: summit; shape of slope: convex  
 Inclusion 4--Landform: Plateaus; geomorphic position: summit

#### ***Major Component Description***

#### ***Snowmore Series***

*Elevation:* 5,100 to 5,400 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Cobbly fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum derived from volcanic rocks

#### ***Snowmore Series***

*Elevation:* 5,100 to 5,400 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Very fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum derived from volcanic rocks

#### ***Dominant Present Vegetation***

Snowmore: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass  
 Snowmore: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass  
 Inclusion 1: Wyoming big sagebrush, bottlebrush squirreltail  
 Inclusion 2: Wyoming big sagebrush, bottlebrush squirreltail  
 Inclusion 3: Low sagebrush  
 Inclusion 4: None

#### ***Ecological Site***

Snowmore: 025XY019NV  
 Snowmore: 025XY019NV  
 Inclusion 1: 025XY019NV  
 Inclusion 2: 025XY019NV  
 Inclusion 3: 025XY018NV  
 Inclusion 4: None

**2781--Snowmore, cobbly-Snowmore, very cobbly-Snowmore association****Composition****Major Components**

Snowmore cobbly fine sandy loam, 2 to 4 percent slopes--40 percent

Snowmore very cobbly loam, 4 to 8 percent slopes--30 percent

Snowmore very fine sandy loam, 0 to 2 percent slopes--15 percent

**Contrasting Inclusions**

Inclusion 1: Rock outcrop--7 percent

Inclusion 2: Troughs cobbly loam, 4 to 8 percent slopes--5 percent

Inclusion 3: Coltroop very fine sandy loam, 0 to 2 percent slopes--3 percent

**Map Unit Setting**

*Landscape position:* Plateaus

Snowmore--Landform: Plateaus; geomorphic position: backslope; shape of slope: concave

Snowmore--Landform: Plateaus; geomorphic position: backslope; shape of slope: convex

Snowmore--Landform: Plateaus; geomorphic position: summit

Inclusion 1--Landform: Plateaus; geomorphic position: summit

Inclusion 2--Landform: Plateaus; geomorphic position: backslope

Inclusion 3--Landform: Plateaus; geomorphic position: summit; shape of slope: convex

**Major Component Description****Snowmore Series**

*Elevation:* 5,100 to 5,400 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Cobbly fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from volcanic rocks

**Snowmore Series**

*Elevation:* 5,100 to 5,400 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Very cobbly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from volcanic rocks

**Snowmore Series**

*Elevation:* 5,100 to 5,400 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Very fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from volcanic rocks

**Dominant Present Vegetation**

Snowmore: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Snowmore: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Snowmore: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Inclusion 1: None

Inclusion 2: Wyoming big sagebrush, bottlebrush squirreltail

Inclusion 3: Wyoming big sagebrush

**Ecological Site**

Snowmore: 025XY019NV

Snowmore: 025XY019NV

Snowmore: 025XY019NV

Inclusion 1: None

Inclusion 2: 025XY019NV

Inclusion 3: 025XY019NV

**2782--Snowmore-Zevadez-Snowmore, cobbly association****Composition****Major Components**

Snowmore very fine sandy loam, 0 to 2 percent slopes--50 percent

Zevadez very fine sandy loam, 0 to 2 percent slopes--20 percent

Snowmore cobbly fine sandy loam, 2 to 4 percent slopes--15 percent

**Contrasting Inclusions**

Inclusion 1: Coltroop very fine sandy loam, 0 to 2 percent slopes--5 percent

Inclusion 2: Wieland very fine sandy loam, 0 to 2 percent slopes--5 percent

Inclusion 3: Troughs cobbly loam, 4 to 8 percent slopes--5 percent

**Map Unit Setting**

*Landscape position:* Plateaus

Snowmore--Landform: Plateaus; geomorphic position: summit

Zevadez--Landform: Plateaus; geomorphic position: footslope

Snowmore--Landform: Plateaus; geomorphic position: backslope

Inclusion 1--Landform: Plateaus; geomorphic position: summit

Inclusion 2--Landform: Plateaus; geomorphic position: footslope; shape of slope: concave

Inclusion 3--Landform: Plateaus; geomorphic position: backslope

**Major Component Description****Snowmore Series**

*Elevation:* 5,100 to 5,400 feet



*Precipitation:* About 9 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Very fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum derived from volcanic rocks

#### **Zevadez Series**

*Elevation:* 5,100 to 5,400 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Very fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

#### **Snowmore Series**

*Elevation:* 5,100 to 5,400 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Cobbly fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum derived from volcanic rocks

#### ***Dominant Present Vegetation***

Snowmore: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass  
 Zevadez: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass  
 Snowmore: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass  
 Inclusion 1: Wyoming big sagebrush, bottlebrush squirreltail  
 Inclusion 2: Wyoming big sagebrush, bottlebrush squirreltail  
 Inclusion 3: Wyoming big sagebrush

#### ***Ecological Site***

Snowmore: 025XY019NV  
 Zevadez: 025XY019NV  
 Snowmore: 025XY019NV  
 Inclusion 1: 025XY019NV  
 Inclusion 2: 025XY019NV  
 Inclusion 3: 025XY019NV

### **2783--Snowmore-Willhill association**

#### ***Composition***

##### ***Major Components***

Snowmore very fine sandy loam, 2 to 8 percent slopes--50 percent  
 Willhill gravelly loam, 4 to 15 percent slopes--35 percent

##### ***Contrasting Inclusions***

Inclusion 1: Midraw gravelly loam, 2 to 8 percent slopes--5 percent

Inclusion 2: Olac cobbly loam, 4 to 8 percent slopes--5 percent  
 Inclusion 3: Lithic Xerollic Haplargids, clayey-skeletal, montmorillonitic, mesic extremely cobbly loam, 0 to 4 percent slopes--3 percent  
 Inclusion 4: Clurde very fine sandy loam, 0 to 2 percent slopes--2 percent

#### ***Map Unit Setting***

*Landscape position:* Plateaus  
 Snowmore--Landform: Plateaus; geomorphic position: summit  
 Willhill--Landform: Plateaus; geomorphic position: backslope  
 Inclusion 1--Landform: Plateaus; geomorphic position: summit  
 Inclusion 2--Landform: Plateaus; geomorphic position: backslope; position on slope: upper part  
 Inclusion 3--Landform: Drainageways  
 Inclusion 4--Landform: Drainageways

#### ***Major Component Description***

##### ***Snowmore Series***

*Elevation:* 5,100 to 5,500 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Very fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum derived from volcanic rocks

##### ***Willhill Series***

*Elevation:* 5,100 to 5,500 feet  
*Precipitation:* About 11 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from volcanic rocks

#### ***Dominant Present Vegetation***

Snowmore: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass  
 Willhill: Wyoming big sagebrush, bluebunch wheatgrass, bluegrass, bottlebrush squirreltail  
 Inclusion 1: Wyoming big sagebrush, bottlebrush squirreltail  
 Inclusion 2: Low sagebrush  
 Inclusion 3: Bluebunch wheatgrass, bottlebrush squirreltail  
 Inclusion 4: Wyoming big sagebrush

#### ***Ecological Site***

Snowmore: 025XY019NV  
 Willhill: 025XY019NV  
 Inclusion 1: 025XY019NV  
 Inclusion 2: 025XY018NV  
 Inclusion 3: 025XY050NV  
 Inclusion 4: 025XY019NV

**2790--Old Camp-Troughs-Olac association****Composition****Major Components**

Old Camp extremely stony loam, 15 to 30 percent slopes--45 percent

Troughs gravelly loam, 2 to 4 percent slopes--25 percent

Olac very stony loam, 4 to 15 percent slopes--20 percent

**Contrasting Inclusions**

Inclusion 1: Snowmore very fine sandy loam, 2 to 4 percent slopes--7 percent

Inclusion 2: Rock outcrop--3 percent

**Map Unit Setting**

*Landscape position:* Plateaus

Old Camp--Landform: Plateaus; geomorphic position: backslope

Troughs--Landform: Plateaus; geomorphic position: summit

Olac--Landform: Plateaus; geomorphic position: backslope

Inclusion 1--Landform: Plateaus; geomorphic position: summit

Inclusion 2--Landform: Plateaus; geomorphic position: summit

**Major Component Description****Old Camp Series**

*Elevation:* 5,300 to 6,000 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 105 days

*Surface layer texture:* Extremely stony loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from volcanic rocks

**Troughs Series**

*Elevation:* 5,300 to 6,000 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from volcanic rocks

**Olac Series**

*Elevation:* 5,300 to 6,000 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Very stony loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from volcanic rocks

**Dominant Present Vegetation**

Old Camp: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Troughs: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Olac: Bluebunch wheatgrass, bluegrass, bottlebrush squirreltail, low sagebrush

Inclusion 1: Wyoming big sagebrush, bottlebrush squirreltail

Inclusion 2: None

**Ecological Site**

Old Camp: 025XY019NV

Troughs: 025XY019NV

Olac: 025XY018NV

Inclusion 1: 025XY019NV

Inclusion 2: None

**2801--Bartome-Alley-Clurde association****Composition****Major Components**

Bartome very fine sandy loam, 2 to 4 percent slopes--40 percent

Alley gravelly loam, 15 to 30 percent slopes--30 percent

Clurde very fine sandy loam, 0 to 2 percent slopes--15 percent

**Contrasting Inclusions**

Inclusion 1: Chime gravelly loam, 8 to 15 percent slopes--5 percent

Inclusion 2: Wieland gravelly loam, 15 to 30 percent slopes--5 percent

Inclusion 3: Yuko sandy loam, 8 to 15 percent slopes--5 percent

**Map Unit Setting**

*Landscape position:* Fan piedmonts

Bartome--Landform: Fan remnants; geomorphic position: summit

Alley--Landform: Fan remnants; geomorphic position: backslope

Clurde--Landform: Fan remnants; geomorphic position: toeslope

Inclusion 1--Landform: Fan remnants; geomorphic position: backslope; position on slope: lower part

Inclusion 2--Landform: Fan remnants; geomorphic position: footslope

Inclusion 3--Landform: Fan remnants; geomorphic position: backslope; aspect: south

**Major Component Description****Bartome Series**

*Elevation:* 5,100 to 5,600 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 105 days

*Surface layer texture:* Very fine sandy loam

*Drainage class:* Well drained



*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

**Alley Series**

*Elevation:* 5,100 to 5,600 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

**Clurde Series**

*Elevation:* 5,100 to 5,600 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Very fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from volcanic rocks, loess and volcanic ash

***Dominant Present Vegetation***

Bartome: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Alley: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Clurde: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Inclusion 1: Wyoming big sagebrush, bottlebrush squirreltail

Inclusion 2: Wyoming big sagebrush, bottlebrush squirreltail

Inclusion 3: Wyoming big sagebrush

***Ecological Site***

Bartome: 025XY019NV

Alley: 025XY019NV

Clurde: 025XY019NV

Inclusion 1: 025XY019NV

Inclusion 2: 025XY019NV

Inclusion 3: 025XY019NV

**2802--Bartome-Bufferan association**

***Composition***

***Major Components***

Bartome very fine sandy loam, 2 to 4 percent slopes--50 percent

Bufferan very fine sandy loam, 0 to 2 percent slopes--35 percent

***Contrasting Inclusions***

Inclusion 1: Zevadez very fine sandy loam, 2 to 4 percent slopes--5 percent

Inclusion 2: Susie Creek very fine sandy loam, 4 to 8 percent slopes--5 percent

Inclusion 3: Dacker very fine sandy loam, 2 to 4 percent slopes--5 percent

***Map Unit Setting***

*Landscape position:* Fan piedmonts

Bartome--Landform: Fan remnants; geomorphic position: backslope

Bufferan--Landform: Fan remnants; geomorphic position: summit

Inclusion 1--Landform: Hills; geomorphic position: footslope

Inclusion 2--Landform: Drainageways

Inclusion 3--Landform: Hills; geomorphic position: backslope

***Major Component Description***

**Bartome Series**

*Elevation:* 5,100 to 5,600 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 105 days

*Surface layer texture:* Very fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

**Bufferan Series**

*Elevation:* 5,100 to 5,600 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Very fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

***Dominant Present Vegetation***

Bartome: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Bufferan: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Inclusion 1: Wyoming big sagebrush, bottlebrush squirreltail

Inclusion 2: Big sagebrush, bottlebrush squirreltail

Inclusion 3: Wyoming big sagebrush

***Ecological Site***

Bartome: 025XY019NV

Bufferan: 025XY019NV

Inclusion 1: 025XY019NV

Inclusion 2: 025XY014NV

Inclusion 3: 025XY019NV

**2803--Bartome-Bufferan-Ramires association**

***Composition***

***Major Components***

Bartome very fine sandy loam, 2 to 4 percent slopes--30 percent

Bufferan very fine sandy loam, 0 to 2 percent slopes--30 percent

Ramires silt loam, 8 to 15 percent slopes--25 percent

**Contrasting Inclusions**

- Inclusion 1: Dacker very fine sandy loam, 2 to 4 percent slopes--5 percent  
 Inclusion 2: Bilbo very gravelly very fine sandy loam, 15 to 30 percent slopes--5 percent  
 Inclusion 3: Aridic Argixerolls, fine-loamy, mixed, frigid gravelly loam, 8 to 15 percent slopes--5 percent

**Map Unit Setting**

- Landscape position:* Fan piedmonts  
 Bartome--Landform: Fan remnants; geomorphic position: backslope  
 Buffaran--Landform: Fan remnants; geomorphic position: summit  
 Ramires--Landform: Pediments; geomorphic position: backslope  
 Inclusion 1--Landform: Fan remnants; geomorphic position: summit  
 Inclusion 2--Landform: Fan remnants; geomorphic position: backslope  
 Inclusion 3--Landform: Fan remnants; geomorphic position: shoulder; aspect: north

**Major Component Description****Bartome Series**

- Elevation:* 5,100 to 5,700 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 105 days  
*Surface layer texture:* Very fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

**Buffaran Series**

- Elevation:* 5,100 to 5,700 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Very fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Ramires Series**

- Elevation:* 5,100 to 5,700 feet  
*Precipitation:* About 11 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Silt loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum derived from tuffaceous rocks

**Dominant Present Vegetation**

- Bartome: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass  
 Buffaran: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass  
 Ramires: Basin wildrye, big sagebrush, bluebunch wheatgrass, rabbitbrush

- Inclusion 1: Wyoming big sagebrush, bottlebrush squirreltail, cheatgrass  
 Inclusion 2: Big sagebrush, bluebunch wheatgrass, cheatgrass  
 Inclusion 3: Wyoming big sagebrush, bottlebrush squirreltail

**Ecological Site**

- Bartome: 025XY019NV  
 Buffaran: 025XY019NV  
 Ramires: 025XY014NV  
 Inclusion 1: 025XY019NV  
 Inclusion 2: 025XY015NV  
 Inclusion 3: 025XY027NV

**2804--Bartome-Chiara association****Composition****Major Components**

- Bartome very fine sandy loam, 0 to 2 percent slopes--50 percent  
 Chiara very fine sandy loam, 2 to 4 percent slopes--35 percent

**Contrasting Inclusions**

- Inclusion 1: Buffaran very fine sandy loam, 0 to 2 percent slopes--5 percent  
 Inclusion 2: Dacker very fine sandy loam, 2 to 4 percent slopes--5 percent  
 Inclusion 3: Xerollic Haplargids, fine, montmorillonitic, mesic extremely cobbly loam, 0 to 4 percent slopes--3 percent  
 Inclusion 4: Zevadez very fine sandy loam, 0 to 2 percent slopes--2 percent

**Map Unit Setting**

- Landscape position:* Fan piedmonts  
 Bartome--Landform: Fan remnants; geomorphic position: summit  
 Chiara--Landform: Fan remnants; geomorphic position: backslope  
 Inclusion 1--Landform: Fan remnants; geomorphic position: summit  
 Inclusion 2--Landform: Fan remnants; geomorphic position: backslope  
 Inclusion 3--Landform: Inset fans  
 Inclusion 4--Landform: Fan remnants; geomorphic position: footslope

**Major Component Description****Bartome Series**

- Elevation:* 5,100 to 5,600 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 105 days  
*Surface layer texture:* Very fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash



**Chiara Series***Elevation:* 5,100 to 5,600 feet*Precipitation:* About 9 inches*Air temperature:* About 47 degrees*Frost-free season:* About 105 days*Surface layer texture:* Very fine sandy loam*Drainage class:* Well drained*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash***Dominant Present Vegetation***

Bartome: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Chiara: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Inclusion 1: Wyoming big sagebrush, bottlebrush squirreltail

Inclusion 2: Wyoming big sagebrush, bottlebrush squirreltail

Inclusion 3: Bluebunch wheatgrass

Inclusion 4: Wyoming big sagebrush

***Ecological Site***

Bartome: 025XY019NV

Chiara: 025XY019NV

Inclusion 1: 025XY019NV

Inclusion 2: 025XY019NV

Inclusion 3: 025XY050NV

Inclusion 4: 025XY019NV

**2805--Bartome very fine sandy loam, 0 to 2 percent slopes*****Composition******Major Components***

Bartome very fine sandy loam, 0 to 2 percent slopes--85 percent

***Contrasting Inclusions***

Inclusion 1: Dacker very fine sandy loam, 0 to 2 percent slopes--10 percent

Inclusion 2: Wieland very fine sandy loam, 4 to 8 percent slopes--5 percent

***Map Unit Setting****Landscape position:* Fan piedmonts

Bartome--Landform: Fan remnants; geomorphic position: summit

Inclusion 1--Landform: Fan remnants; geomorphic position: shoulder

Inclusion 2--Landform: Fan remnants; geomorphic position: toeslope

***Major Component Description*****Bartome Series***Elevation:* 5,100 to 5,500 feet*Precipitation:* About 9 inches*Air temperature:* About 47 degrees*Frost-free season:* About 105 days*Surface layer texture:* Very fine sandy loam*Drainage class:* Well drained*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash***Dominant Present Vegetation***

Bartome: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Inclusion 1: Wyoming big sagebrush, bottlebrush squirreltail

Inclusion 2: Wyoming big sagebrush, bottlebrush squirreltail

***Ecological Site***

Bartome: 025XY019NV

Inclusion 1: 025XY019NV

Inclusion 2: 025XY019NV

**2807--Bartome-Coltroop-Zevadez association*****Composition******Major Components***

Bartome very fine sandy loam, 0 to 2 percent slopes--40 percent

Coltroop very fine sandy loam, 2 to 4 percent slopes--25 percent

Zevadez gravelly loam, 2 to 4 percent slopes--20 percent

***Contrasting Inclusions***

Inclusion 1: Vanwyper extremely stony loam, 0 to 2 percent slopes--5 percent

Inclusion 2: Shalake very fine sandy loam, 2 to 4 percent slopes--5 percent

Inclusion 3: Lithic Xerollic Camborthids, loamy, mixed, mesic very gravelly loam, 2 to 4 percent slopes--5 percent

***Map Unit Setting****Landscape position:* Hills and intermontane basins

Bartome--Landform: Fan remnants; geomorphic position: summit

Coltroop--Landform: Pediments; geomorphic position: shoulder

Zevadez--Landform: Fan remnants; geomorphic position: backslope

Inclusion 1--Landform: Hills; geomorphic position: footslope

Inclusion 2--Landform: Hills; geomorphic position: backslope

Inclusion 3--Landform: Hills; geomorphic position: toeslope

***Major Component Description*****Bartome Series***Elevation:* 5,100 to 5,500 feet*Precipitation:* About 9 inches*Air temperature:* About 47 degrees*Frost-free season:* About 105 days*Surface layer texture:* Very fine sandy loam*Drainage class:* Well drained*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

**Coltroop Series***Elevation:* 5,100 to 5,500 feet*Precipitation:* About 9 inches*Air temperature:* About 47 degrees*Frost-free season:* About 110 days*Surface layer texture:* Very fine sandy loam*Drainage class:* Well drained*Dominant parent material:* Alluvium derived from volcanic rocks, loess and volcanic ash**Zevadez Series***Elevation:* 5,100 to 5,500 feet*Precipitation:* About 9 inches*Air temperature:* About 47 degrees*Frost-free season:* About 110 days*Surface layer texture:* Gravelly loam*Drainage class:* Well drained*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash***Dominant Present Vegetation***

Bartome: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Coltroop: Big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Zevadez: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Inclusion 1: Wyoming big sagebrush, bottlebrush squirreltail, cheatgrass

Inclusion 2: Wyoming big sagebrush, bottlebrush squirreltail, cheatgrass

Inclusion 3: Wyoming big sagebrush, bottlebrush squirreltail

***Ecological Site***

Bartome: 025XY019NV

Coltroop: 025XY019NV

Zevadez: 025XY019NV

Inclusion 1: 025XY019NV

Inclusion 2: 025XY019NV

Inclusion 3: 025XY019NV

**2808--Bartome-Susie Creek-Wieland association*****Composition******Major Components***

Bartome very fine sandy loam, 2 to 4 percent slopes--40 percent

Susie Creek very fine sandy loam, 2 to 4 percent slopes--25 percent

Wieland very fine sandy loam, 4 to 8 percent slopes--20 percent

***Contrasting Inclusions***

Inclusion 1: Buffaran very fine sandy loam, 0 to 2 percent slopes--5 percent

Inclusion 2: Ramires silt loam, 8 to 15 percent slopes--5 percent

Inclusion 3: Dacker very fine sandy loam, 2 to 4 percent slopes--5 percent

***Map Unit Setting****Landscape position:* Hills and intermontane basins

Bartome--Landform: Fan remnants; geomorphic position: summit

Susie Creek--Landform: Pediments; geomorphic position: footslope; aspect: north

Wieland--Landform: Fan remnants; geomorphic position: backslope

Inclusion 1--Landform: Fan remnants; geomorphic position: summit

Inclusion 2--Landform: Hills; geomorphic position: backslope

Inclusion 3--Landform: Fan remnants; geomorphic position: shoulder

***Major Component Description*****Bartome Series***Elevation:* 5,100 to 5,700 feet*Precipitation:* About 9 inches*Air temperature:* About 47 degrees*Frost-free season:* About 105 days*Surface layer texture:* Very fine sandy loam*Drainage class:* Well drained*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash**Susie Creek Series***Elevation:* 5,100 to 5,600 feet*Precipitation:* About 11 inches*Air temperature:* About 44 degrees*Frost-free season:* About 90 days*Surface layer texture:* Very fine sandy loam*Drainage class:* Well drained*Dominant parent material:* Residuum derived from tuffaceous rocks**Wieland Series***Elevation:* 5,100 to 5,700 feet*Precipitation:* About 9 inches*Air temperature:* About 47 degrees*Frost-free season:* About 110 days*Surface layer texture:* Very fine sandy loam*Drainage class:* Well drained*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash***Dominant Present Vegetation***

Bartome: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Susie Creek: Basin big sagebrush, bluebunch wheatgrass, bluegrass, rabbitbrush

Wieland: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Inclusion 1: Wyoming big sagebrush, bottlebrush squirreltail, cheatgrass

Inclusion 2: Big sagebrush, bottlebrush squirreltail, cheatgrass



Inclusion 3: Wyoming big sagebrush, bottlebrush squirreltail

### ***Ecological Site***

Bartome: 025XY019NV  
Susie Creek: 025XY014NV  
Wieland: 025XY019NV  
Inclusion 1: 025XY019NV  
Inclusion 2: 025XY014NV  
Inclusion 3: 025XY019NV

## **2809--Bartome-Dacker association**

### ***Composition***

#### ***Major Components***

Bartome silt loam, 0 to 2 percent slopes--45 percent  
Dacker silt loam, 2 to 8 percent slopes--40 percent

#### ***Contrasting Inclusions***

Inclusion 1: Hunnton silt loam, 2 to 4 percent slopes--6 percent  
Inclusion 2: Wieland very fine sandy loam, 2 to 4 percent slopes--5 percent  
Inclusion 3: Chiara very fine sandy loam, 0 to 2 percent slopes--3 percent  
Inclusion 4: Xerollic Haplargids, fine, montmorillonitic, mesic extremely stony loam, 0 to 4 percent slopes--1 percent

### ***Map Unit Setting***

*Landscape position:* Fan piedmonts

Bartome--Landform: Fan remnants; geomorphic position: summit

Dacker--Landform: Fan remnants; geomorphic position: backslope

Inclusion 1--Landform: Fan remnants; geomorphic position: backslope

Inclusion 2--Landform: Fan remnants; geomorphic position: backslope

Inclusion 3--Landform: Fan remnants; geomorphic position: summit

Inclusion 4--Landform: Inset fans; geomorphic position: footslope; shape of slope: concave

### ***Major Component Description***

#### ***Bartome Series***

*Elevation:* 5,200 to 5,300 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 105 days

*Surface layer texture:* Silt loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

#### ***Dacker Series***

*Elevation:* 5,200 to 5,300 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Silt loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

### ***Dominant Present Vegetation***

Bartome: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Dacker: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Inclusion 1: Wyoming big sagebrush, bottlebrush squirreltail, cheatgrass

Inclusion 2: Big sagebrush, bottlebrush squirreltail, cheatgrass

Inclusion 3: Wyoming big sagebrush, bottlebrush squirreltail

Inclusion 4: Bottlebrush squirreltail

### ***Ecological Site***

Bartome: 025XY019NV

Dacker: 025XY019NV

Inclusion 1: 025XY019NV

Inclusion 2: 025XY019NV

Inclusion 3: 025XY019NV

Inclusion 4: 025XY050NV

## **2820--Alley-Vanwyper-Rock outcrop association**

### ***Composition***

#### ***Major Components***

Alley very stony loam, 8 to 15 percent slopes--45 percent

Vanwyper very stony loam, 8 to 15 percent slopes--25 percent

Rock outcrop--15 percent

#### ***Contrasting Inclusions***

Inclusion 1: Xeric Torrifluvents, sandy, mixed, mesic loamy sand, 0 to 2 percent slopes--5 percent

Inclusion 2: Aridic Argixerolls, fine-loamy, mixed, mesic gravelly loam, 4 to 15 percent slopes--5 percent

Inclusion 3: Puett gravelly loam, 15 to 30 percent slopes--3 percent

Inclusion 4: Rubble land fragmental material--2 percent

### ***Map Unit Setting***

*Landscape position:* Plateaus

Alley--Landform: Plateaus; geomorphic position: backslope

Vanwyper--Landform: Plateaus; geomorphic position: backslope

Rock outcrop--Landform: Plateaus; geomorphic position: backslope

Inclusion 1--Landform: Drainageways

Inclusion 2--Landform: Plateaus; geomorphic position: backslope; aspect: north

Inclusion 3--Landform: Plateaus; geomorphic position: backslope; aspect: south

Inclusion 4--Landform: Plateaus; geomorphic position: backslope

**Major Component Description****Alley Series***Elevation:* 4,800 to 5,600 feet*Precipitation:* About 9 inches*Air temperature:* About 47 degrees*Frost-free season:* About 110 days*Surface layer texture:* Very stony loam*Drainage class:* Well drained*Dominant parent material:* Residuum and colluvium derived from volcanic rocks**Vanwyper Series***Elevation:* 4,800 to 5,600 feet*Precipitation:* About 10 inches*Air temperature:* About 47 degrees*Frost-free season:* About 110 days*Surface layer texture:* Very stony loam*Drainage class:* Well drained*Dominant parent material:* Residuum and colluvium derived from volcanic rocks**Rock outcrop Miscellaneous Area***Elevation:* 4,800 to 5,600 feet*Drainage class:* Excessively drained**Dominant Present Vegetation**

Alley: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Vanwyper: Wyoming big sagebrush, bottlebrush squirreltail, cheatgrass

Rock outcrop: None

Inclusion 1: Basin big sagebrush, basin wildrye, rabbitbrush

Inclusion 2: Big sagebrush, bluebunch wheatgrass, bottlebrush squirreltail

Inclusion 3: Wyoming big sagebrush

Inclusion 4: None

**Ecological Site**

Alley: 025XY019NV

Vanwyper: 025XY019NV

Rock outcrop: None

Inclusion 1: 024XY006NV

Inclusion 2: 025XY014NV

Inclusion 3: 025XY025NV

Inclusion 4: None

**2822--Alley-Rock outcrop-Rubble land association****Composition****Major Components**

Alley very stony loam, 50 to 75 percent slopes--45 percent

Rock outcrop--25 percent

Rubble land fragmental material--20 percent

**Contrasting Inclusions**

Inclusion 1: Alley cobbly fine sandy loam, 30 to 50 percent slopes--10 percent

**Map Unit Setting***Landscape position:* Hills

Alley--Landform: Hills; geomorphic position: backslope

Rock outcrop--Landform: Hills; geomorphic position: summit

Rubble land--Landform: Hills; geomorphic position: backslope

Inclusion 1--Landform: Hills; geomorphic position: footslope

**Major Component Description****Alley Series***Elevation:* 4,900 to 5,700 feet*Precipitation:* About 9 inches*Air temperature:* About 47 degrees*Frost-free season:* About 110 days*Surface layer texture:* Very stony loam*Drainage class:* Well drained*Dominant parent material:* Residuum and colluvium derived from volcanic rocks**Rock outcrop Miscellaneous Area***Elevation:* 4,900 to 5,700 feet*Drainage class:* Excessively drained**Rubble land Miscellaneous Area***Elevation:* 4,900 to 5,500 feet*Surface layer texture:* Fragmental material*Drainage class:* Excessively drained**Dominant Present Vegetation**

Alley: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Rock outcrop: None

Rubble land: None

Inclusion 1: Wyoming big sagebrush, bottlebrush squirreltail

**Ecological Site**

Alley: 025XY019NV

Rubble land: None

Rock outcrop: None

Inclusion 1: 025XY019NV

**3000--Handy-Wilson-Deseed association****Composition****Major Components**

Handy loam, 15 to 30 percent slopes--40 percent

Wilson loam, 4 to 8 percent slopes--25 percent

Deseed gravelly loam, 4 to 15 percent slopes--20 percent

**Contrasting Inclusions**

Inclusion 1: Xerollic Haplargids, fine-loamy, mixed, frigid gravelly loam, 30 to 50 percent slopes--7 percent

Inclusion 2: Rock outcrop--5 percent

Inclusion 3: Lithic Xerollic Haplargids, loamy, mixed, frigid very gravelly loam, 4 to 15 percent slopes--3 percent



**Map Unit Setting***Landscape position:* Hills*Handy--Landform:* Hills; geomorphic position: backslope; aspect: north*Wilsor--Landform:* Hills; geomorphic position: footslope*Deseed--Landform:* Hills; geomorphic position: summit*Inclusion 1--Landform:* Hills; geomorphic position: backslope; aspect: south*Inclusion 2--Landform:* Hills; geomorphic position: summit*Inclusion 3--Landform:* Hills; geomorphic position: summit**Major Component Description****Handy Series***Elevation:* 5,500 to 6,500 feet*Precipitation:* About 11 inches*Air temperature:* About 44 degrees*Frost-free season:* About 85 days*Surface layer texture:* Loam*Drainage class:* Well drained*Dominant parent material:* Alluvium and colluvium derived from volcanic rocks**Wilsor Series***Elevation:* 5,500 to 6,500 feet*Precipitation:* About 11 inches*Air temperature:* About 44 degrees*Frost-free season:* About 85 days*Surface layer texture:* Loam*Drainage class:* Well drained*Dominant parent material:* Residuum and colluvium derived from tuffaceous rocks**Deseed Series***Elevation:* 5,500 to 6,500 feet*Precipitation:* About 11 inches*Air temperature:* About 44 degrees*Frost-free season:* About 85 days*Surface layer texture:* Gravelly loam*Drainage class:* Well drained*Dominant parent material:* Residuum and colluvium derived from volcanic rocks**Dominant Present Vegetation***Handy:* Big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass*Wilsor:* Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass*Deseed:* Big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass*Inclusion 1:* Big sagebrush, cheatgrass*Inclusion 2:* None*Inclusion 3:* Big sagebrush, bottlebrush squirreltail**Ecological Site***Handy:* 025XY014NV*Wilsor:* 025XY019NV*Deseed:* 025XY014NV*Inclusion 1:* 025XY015NV*Inclusion 2:* None*Inclusion 3:* 025XY014NV**3010--Relley-Kelk association****Composition****Major Components***Relley silt loam,* 0 to 2 percent slopes, frequently flooded--65 percent*Kelk very fine sandy loam,* 0 to 2 percent slopes--20 percent**Contrasting Inclusions***Inclusion 1:* Zevadez very fine sandy loam, 0 to 2 percent slopes--10 percent*Inclusion 2:* Dacker very fine sandy loam, 0 to 2 percent slopes--5 percent**Map Unit Setting***Landscape position:* Fan piedmonts*Relley--Landform:* Inset fans*Kelk--Landform:* Inset fans*Inclusion 1--Landform:* Hills; geomorphic position: footslope*Inclusion 2--Landform:* Hills; geomorphic position: backslope**Major Component Description****Relley Series***Elevation:* 5,100 to 5,200 feet*Precipitation:* About 8 inches*Air temperature:* About 48 degrees*Frost-free season:* About 110 days*Surface layer texture:* Silt loam*Drainage class:* Well drained*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash**Kelk Series***Elevation:* 5,100 to 5,200 feet*Precipitation:* About 9 inches*Air temperature:* About 47 degrees*Frost-free season:* About 110 days*Surface layer texture:* Very fine sandy loam*Drainage class:* Well drained*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash**Dominant Present Vegetation***Relley:* Bottlebrush squirreltail*Kelk:* Indian ricegrass, Wyoming big sagebrush, bottlebrush squirreltail*Inclusion 1:* Wyoming big sagebrush, bottlebrush squirreltail*Inclusion 2:* Wyoming big sagebrush, bottlebrush squirreltail**Ecological Site***Relley:* 024XY012NV*Kelk:* 025XY019NV*Inclusion 1:* 025XY019NV*Inclusion 2:* 025XY019NV

**3020--Sodhouse-Chiara association*****Composition******Major Components***

Sodhouse silt loam, 0 to 2 percent slopes--50 percent

Chiara silt loam, 2 to 4 percent slopes--35 percent

***Contrasting Inclusions***

Inclusion 1: Dacker very fine sandy loam, 2 to 4 percent slopes--6 percent

Inclusion 2: Shalake very fine sandy loam, 2 to 4 percent slopes--5 percent

Inclusion 3: Clurde very fine sandy loam, 0 to 2 percent slopes--2 percent

Inclusion 4: Typic Calciorthids, fine-loamy, mixed, mesic very gravelly loam, 0 to 2 percent slopes--2 percent

***Map Unit Setting***

*Landscape position:* Fan piedmonts

Sodhouse--Landform: Fan remnants; geomorphic position: summit

Chiara--Landform: Fan remnants; geomorphic position: backslope

Inclusion 1--Landform: Fan remnants; geomorphic position: backslope

Inclusion 2--Landform: Fan remnants; geomorphic position: shoulder

Inclusion 3--Landform: Inset fans

Inclusion 4--Landform: Fan remnants; geomorphic position: summit

***Major Component Description******Sodhouse Series***

*Elevation:* 5,100 to 5,300 feet

*Precipitation:* About 8 inches

*Air temperature:* About 48 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Silt loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

***Chiara Series***

*Elevation:* 5,100 to 5,300 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 105 days

*Surface layer texture:* Silt loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks, loess and volcanic ash

***Dominant Present Vegetation***

Sodhouse: Bottlebrush squirreltail, winterfat, winterfat  
Chiara: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Inclusion 1: Wyoming big sagebrush, bottlebrush squirreltail

Inclusion 2: Wyoming big sagebrush, bottlebrush squirreltail

Inclusion 3: Wyoming big sagebrush

Inclusion 4: Shadscale

***Ecological Site***

Sodhouse: 024XY059NV

Chiara: 025XY019NV

Inclusion 1: 025XY019NV

Inclusion 2: 025XY019NV

Inclusion 3: 025XY019NV

Inclusion 4: 024XY002NV

**3030--Deepeek-Alley association*****Composition******Major Components***

Deepeek very cobbly loam, 8 to 15 percent slopes--45 percent

Alley very cobbly very fine sandy loam, 15 to 30 percent slopes--40 percent

***Contrasting Inclusions***

Inclusion 1: Haploxerollic Durargids, loamy-skeletal, mixed, mesic gravelly loam, 15 to 30 percent slopes--9 percent

Inclusion 2: Wieland cobbly loam, 2 to 8 percent slopes--2 percent

Inclusion 3: Durixerollic Haplargids, clayey-skeletal, montmorillonitic, mesic very cobbly loam, 4 to 8 percent slopes--2 percent

Inclusion 4: Puett gravelly loam, 8 to 15 percent slopes--2 percent

***Map Unit Setting***

*Landscape position:* Fan piedmonts

Deepeek--Landform: Fan remnants; geomorphic position: backslope; position on slope: upper part

Alley--Landform: Fan remnants; geomorphic position: shoulder

Inclusion 1--Landform: Fan remnants; geomorphic position: backslope

Inclusion 2--Landform: Fan remnants; geomorphic position: toeslope; position on slope: lower part

Inclusion 3--Landform: Fan remnants; geomorphic position: backslope; position on slope: upper part

Inclusion 4--Landform: Fan remnants; geomorphic position: backslope; shape of slope: convex; aspect: south

***Major Component Description******Deepeek Series***

*Elevation:* 4,800 to 5,600 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 105 days

*Surface layer texture:* Very cobbly loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium and colluvium derived from mixed rocks

***Alley Series***

*Elevation:* 4,800 to 5,600 feet

*Precipitation:* About 9 inches



*Air temperature:* About 47 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Very cobbly very fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

#### ***Dominant Present Vegetation***

Deepeek: Wyoming big sagebrush  
 Alley: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass  
 Inclusion 1: Big sagebrush, cheatgrass  
 Inclusion 2: Wyoming big sagebrush, bottlebrush squirreltail  
 Inclusion 3: Wyoming big sagebrush  
 Inclusion 4: Wyoming big sagebrush

#### ***Ecological Site***

Deepeek: 025XY019NV  
 Alley: 025XY019NV  
 Inclusion 1: 025XY015NV  
 Inclusion 2: 025XY019NV  
 Inclusion 3: 025XY019NV  
 Inclusion 4: 025XY025NV

### **3100--Ratsow-Quarz-Susie Creek association**

#### ***Composition***

##### ***Major Components***

Ratsow loam, 4 to 15 percent slopes--50 percent  
 Quarz very cobbly loam, 4 to 8 percent slopes--20 percent  
 Susie Creek loam, 4 to 15 percent slopes--15 percent  
**Contrasting Inclusions**  
 Inclusion 1: Lithic Argixerolls, loamy, mixed, frigid very gravelly loam, 4 to 8 percent slopes--5 percent  
 Inclusion 2: Xerollic Durargids, clayey-skeletal, montmorillonitic, frigid, shallow gravelly loam, 8 to 15 percent slopes--5 percent  
 Inclusion 3: Lithic Argixerolls, clayey-skeletal, montmorillonitic, frigid very gravelly loam, 30 to 50 percent slopes--3 percent  
 Inclusion 4: Rock outcrop--2 percent

#### ***Map Unit Setting***

*Landscape position:* Hills  
 Ratsow--Landform: Hills; geomorphic position: backslope  
 Quarz--Landform: Hills; geomorphic position: summit  
 Susie Creek--Landform: Hills; geomorphic position: backslope  
 Inclusion 1--Landform: Hills; geomorphic position: summit  
 Inclusion 2--Landform: Hills; geomorphic position: backslope; position on slope: upper part  
 Inclusion 3--Landform: Hills; geomorphic position: backslope  
 Inclusion 4--Landform: Hills; geomorphic position: backslope

#### ***Major Component Description***

##### ***Ratsow Series***

*Elevation:* 5,400 to 6,000 feet  
*Precipitation:* About 11 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum derived from volcanic rocks

##### ***Quarz Series***

*Elevation:* 5,400 to 6,000 feet  
*Precipitation:* About 12 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Very cobbly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

##### ***Susie Creek Series***

*Elevation:* 5,400 to 6,000 feet  
*Precipitation:* About 11 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 90 days  
*Surface layer texture:* Loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum derived from tuffaceous rocks

#### ***Dominant Present Vegetation***

Ratsow: Big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass  
 Quarz: Bottlebrush squirreltail  
 Susie Creek: Basin big sagebrush, bluebunch wheatgrass, bluegrass, rabbitbrush  
 Inclusion 1: Big sagebrush, bottlebrush squirreltail  
 Inclusion 2: Big sagebrush, bottlebrush squirreltail  
 Inclusion 3: Mountain big sagebrush  
 Inclusion 4: None

#### ***Ecological Site***

Ratsow: 025XY014NV  
 Quarz: 025XY014NV  
 Susie Creek: 025XY014NV  
 Inclusion 1: 025XY014NV  
 Inclusion 2: 025XY014NV  
 Inclusion 3: 025XY012NV  
 Inclusion 4: None

### **3510--Midraw-Troughs-Midraw, strongly sloping association**

#### ***Composition***

##### ***Major Components***

Midraw gravelly loam, 2 to 8 percent slopes--35 percent  
 Troughs gravelly loam, 8 to 15 percent slopes--30 percent

Midraw gravelly loam, 8 to 15 percent slopes--20 percent

**Contrasting Inclusions**

Inclusion 1: Chiara very fine sandy loam, 2 to 4 percent slopes--5 percent

Inclusion 2: Ratsow loam, 4 to 15 percent slopes--5 percent

Inclusion 3: Linkup very cobbly loam, 8 to 15 percent slopes--5 percent

**Map Unit Setting**

*Landscape position:* Plateaus

Midraw--Landform: Plateaus; geomorphic position: summit

Troughs--Landform: Plateaus; geomorphic position: backslope

Midraw--Landform: Plateaus; geomorphic position: backslope

Inclusion 1--Landform: Plateaus; geomorphic position: footslope

Inclusion 2--Landform: Plateaus; geomorphic position: backslope; aspect: north

Inclusion 3--Landform: Plateaus; geomorphic position: backslope; shape of slope: convex; aspect: north

**Major Component Description**

**Midraw Series**

*Elevation:* 5,300 to 5,600 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from volcanic rocks

**Troughs Series**

*Elevation:* 5,300 to 5,600 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from volcanic rocks

**Midraw Series**

*Elevation:* 5,300 to 5,600 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from volcanic rocks

**Dominant Present Vegetation**

Midraw: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Troughs: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Midraw: Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, cheatgrass

Inclusion 1: Wyoming big sagebrush, bottlebrush squirreltail

Inclusion 2: Big sagebrush, bottlebrush squirreltail

Inclusion 3: Low sagebrush

**Ecological Site**

Midraw: 025XY019NV

Troughs: 025XY019NV

Midraw: 025XY019NV

Inclusion 1: 025XY019NV

Inclusion 2: 025XY014NV

Inclusion 3: 025XY018NV

**3710--Petan-Bulake-Rock outcrop association**

**Composition**

**Major Components**

Petan extremely stony loam, 4 to 15 percent slopes--50 percent

Bulake gravelly loam, 2 to 8 percent slopes--20 percent

Rock outcrop--15 percent

**Contrasting Inclusions**

Inclusion 1: Deunah silt loam, 2 to 4 percent slopes--10 percent

Inclusion 2: Hatpeak loam, 2 to 4 percent slopes--3 percent

Inclusion 3: Rubble land fragmental material--2 percent

**Map Unit Setting**

*Landscape position:* Hills

Petan--Landform: Hills; geomorphic position: backslope

Bulake--Landform: Hills; geomorphic position: toeslope

Rock outcrop--Landform: Hills; geomorphic position: summit

Inclusion 1--Landform: Hills; geomorphic position: backslope; position on slope: upper part

Inclusion 2--Landform: Hills; geomorphic position: backslope

Inclusion 3--Landform: Hills; geomorphic position: backslope

**Major Component Description**

**Petan Series**

*Elevation:* 5,300 to 5,700 feet

*Precipitation:* About 14 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Extremely stony loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from volcanic rocks

**Bulake Series**

*Elevation:* 5,300 to 5,700 feet

*Precipitation:* About 14 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Gravelly loam



*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from volcanic rocks

#### **Rock outcrop Miscellaneous Area**

*Elevation:* 5,300 to 5,700 feet

*Drainage class:* Excessively drained

#### ***Dominant Present Vegetation***

Petan: Bluegrass, bottlebrush squirreltail, low sagebrush

Bulake: Bluegrass, bottlebrush squirreltail, low sagebrush

Rock outcrop: None

Inclusion 1: Low sagebrush

Inclusion 2: Idaho fescue, basin big sagebrush

Inclusion 3: None

#### ***Ecological Site***

Petan: 025XY022NV

Bulake: 025XY017NV

Rock outcrop: None

Inclusion 1: 025XY017NV

Inclusion 2: 025XY027NV

Inclusion 3: None

### **3715--Petan-Deunah-Hatpeak association**

#### ***Composition***

##### ***Major Components***

Petan very cobbly loam, 4 to 8 percent slopes--35 percent

Deunah silt loam, 2 to 4 percent slopes--30 percent

Hatpeak loam, 2 to 4 percent slopes--20 percent

##### ***Contrasting Inclusions***

Inclusion 1: Typic Durixerolls, fine-loamy, mixed, frigid silt loam, 2 to 4 percent slopes--5 percent

Inclusion 2: Rubble land fragmental material--5 percent

Inclusion 3: Bulake gravelly loam, 2 to 8 percent slopes--3 percent

Inclusion 4: Rock outcrop--2 percent

#### ***Map Unit Setting***

*Landscape position:* Plateaus

Petan--Landform: Plateaus; geomorphic position: summit

Deunah--Landform: Plateaus; geomorphic position: shoulder

Hatpeak--Landform: Plateaus; geomorphic position: backslope

Inclusion 1--Landform: Plateaus; geomorphic position: backslope; position on slope: lower part

Inclusion 2--Landform: Plateaus; geomorphic position: backslope

Inclusion 3--Landform: Plateaus; geomorphic position: summit; position on slope: upper part

Inclusion 4--Landform: Plateaus

#### ***Major Component Description***

##### **Petan Series**

*Elevation:* 5,300 to 5,700 feet

*Precipitation:* About 14 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Very cobbly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from volcanic rocks

##### **Deunah Series**

*Elevation:* 5,300 to 5,700 feet

*Precipitation:* About 14 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Silt loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from volcanic rocks, loess and volcanic ash

##### **Hatpeak Series**

*Elevation:* 5,300 to 5,700 feet

*Precipitation:* About 14 inches

*Air temperature:* About 44 degrees

*Frost-free season:* About 85 days

*Surface layer texture:* Loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from volcanic rocks, loess and volcanic ash

#### ***Dominant Present Vegetation***

Petan: Low sagebrush

Deunah: Idaho fescue, alkali sagebrush, bluebunch wheatgrass

Hatpeak: Idaho fescue, basin big sagebrush, bluebunch wheatgrass

Inclusion 1: Basin big sagebrush

Inclusion 2: None

Inclusion 3: Low sagebrush

Inclusion 4: None

#### ***Ecological Site***

Petan: 025XY022NV

Deunah: 025XY017NV

Hatpeak: 025XY027NV

Inclusion 1: 025XY027NV

Inclusion 2: None

Inclusion 3: 025XY017NV

Inclusion 4: None

### **3721--Hatpeak-Deunah association**

#### ***Composition***

##### ***Major Components***

Hatpeak loam, 2 to 4 percent slopes--55 percent

Deunah silt loam, 2 to 4 percent slopes--30 percent

##### ***Contrasting Inclusions***

Inclusion 1: Typic Durixerolls, fine-loamy, mixed, frigid gravelly loam, 2 to 4 percent slopes--10 percent

- Inclusion 2: Petan very cobbly loam, 4 to 8 percent slopes--3 percent  
 Inclusion 3: Bulake gravelly loam, 2 to 8 percent slopes--2 percent

### **Map Unit Setting**

- Landscape position:* Plateaus  
 Hatpeak--Landform: Plateaus; geomorphic position: backslope  
 Deunah--Landform: Plateaus; geomorphic position: summit  
 Inclusion 1--Landform: Plateaus; geomorphic position: backslope; position on slope: lower part  
 Inclusion 2--Landform: Plateaus; geomorphic position: summit  
 Inclusion 3--Landform: Plateaus; geomorphic position: summit; position on slope: upper part

### **Major Component Description**

#### **Hatpeak Series**

- Elevation:* 5,300 to 5,700 feet  
*Precipitation:* About 14 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from volcanic rocks, loess and volcanic ash

#### **Deunah Series**

- Elevation:* 5,300 to 5,700 feet  
*Precipitation:* About 14 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Silt loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from volcanic rocks, loess and volcanic ash

### **Dominant Present Vegetation**

- Hatpeak: Idaho fescue, basin big sagebrush, bluebunch wheatgrass  
 Deunah: Idaho fescue, alkali sagebrush, bluebunch wheatgrass  
 Inclusion 1: Basin big sagebrush  
 Inclusion 2: Low sagebrush  
 Inclusion 3: Low sagebrush

### **Ecological Site**

- Hatpeak: 025XY027NV  
 Deunah: 025XY017NV  
 Inclusion 1: 025XY027NV  
 Inclusion 2: 025XY022NV  
 Inclusion 3: 025XY017NV

## **3722--Hatpeak-Hatpeak, moderately steep association**

### **Composition**

#### **Major Components**

- Hatpeak loam, 2 to 8 percent slopes--70 percent  
 Hatpeak loam, 8 to 15 percent slopes--15 percent

#### **Contrasting Inclusions**

- Inclusion 1: Typic Argixerolls, fine, montmorillonitic, frigid very gravelly loam--7 percent  
 Inclusion 2: Gumble very gravelly very fine sandy loam, 30 to 50 percent slopes--3 percent  
 Inclusion 3: Bilbo very gravelly very fine sandy loam, 30 to 50 percent slopes--3 percent  
 Inclusion 4: Crooked Creek silty clay loam, drained, 0 to 2 percent slopes, rarely flooded--2 percent

### **Map Unit Setting**

- Landscape position:* Intermontane basins  
 Hatpeak--Landform: Fan remnants; geomorphic position: summit  
 Hatpeak--Landform: Fan remnants; geomorphic position: backslope  
 Inclusion 1--Landform: Fan remnants; geomorphic position: toeslope; shape of slope: concave; aspect: north  
 Inclusion 2--Landform: Fan remnants; geomorphic position: backslope; shape of slope: convex; aspect: south  
 Inclusion 3--Landform: Fan remnants; geomorphic position: backslope; aspect: south  
 Inclusion 4--Landform: Flood plains

### **Major Component Description**

#### **Hatpeak Series**

- Elevation:* 5,200 to 5,800 feet  
*Precipitation:* About 14 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from volcanic rocks, loess and volcanic ash

#### **Hatpeak Series**

- Elevation:* 5,200 to 5,800 feet  
*Precipitation:* About 14 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 85 days  
*Surface layer texture:* Loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from volcanic rocks, loess and volcanic ash

### **Dominant Present Vegetation**

- Hatpeak: Idaho fescue, basin big sagebrush, bluebunch wheatgrass  
 Hatpeak: Idaho fescue, basin big sagebrush, bluebunch wheatgrass  
 Inclusion 1: Idaho fescue, basin big sagebrush



Inclusion 2: Big sagebrush, bluebunch wheatgrass,  
cheatgrass

Inclusion 3: Big sagebrush, cheatgrass

Inclusion 4: Basin big sagebrush, basin wildrye

### ***Ecological Site***

Hatpeak: 025XY027NV

Hatpeak: 025XY027NV

Inclusion 1: 025XY027NV

Inclusion 2: 025XY015NV

Inclusion 3: 025XY015NV

Inclusion 4: 025XY003NV

## **W--Water**

### ***Composition***

#### ***Major Components***

Water--100 percent

### ***Map Unit Setting***

*Landscape position:* Hills and intermontane basins

Water--Landform: Depressions

### ***Major Component Description***

#### **Water Miscellaneous Area**

*Elevation:* 5,500 to 8,000 feet

### ***Dominant Present Vegetation***

Water: None

### ***Ecological Site***

Water: None

# Prime Farmland

---

## Prime Farmland and Other Important Farmland

In this section, prime farmland and other important farmland are defined. The map units in the survey area that are considered prime farmland are listed under "Prime Farmland Map Units" at the end of this section.

### Prime Farmland

Prime farmland is of major importance in meeting the Nation's short- and long-range needs for food and fiber. The acreage of high-quality farmland is limited, and the U.S. Department of Agriculture recognizes that government at local, State, and Federal levels, as well as individuals, must encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland soils, as defined by the U.S. Department of Agriculture, are soils that are best suited to food, seed, forage, fiber, and oilseed crops. Such soils have properties that favor the economic production of sustained high yields of crops. The soils need only to be treated and managed by acceptable farming methods. An adequate moisture supply and a sufficiently long growing season are required. Prime farmland soils produce the highest yields with minimal expenditure of energy and economic resources, and farming these soils results in the least damage to the environment.

Prime farmland soils may presently be used as cropland, pasture, woodland, or for other purposes. They are used for food and fiber or are available for these uses. Urban or built-up land and water areas cannot be considered prime farmland. Urban or built-up land is any contiguous unit of land 10 acres or more in size that is used for such purposes as housing, industrial, and commercial sites, sites for institutions or public buildings, small parks, golf courses, cemeteries, railroad yards, airports, sanitary landfills, sewage treatment plants, and water-control structures.

Prime farmland soils commonly receive an adequate and dependable supply of moisture from precipitation or irrigation. The temperature and growing season are favorable, and the level of acidity or alkalinity and the content of salts and sodium are acceptable. The soils have few, if any, rocks and are permeable to water and air. They are not excessively erodible or saturated with water for long periods, and they are not frequently flooded during the growing season or are

protected from flooding. Slopes range mainly from 0 to 6 percent.

Soils that have a high water table, are subject to flooding, or are droughty may qualify as prime farmland where these limitations are overcome by drainage measures, flood control, or irrigation. Onsite evaluation is necessary to determine the effectiveness of corrective measures. More information about the criteria for prime farmland can be obtained at the local office of the Natural Resources Conservation Service.

A recent trend in land use has been the conversion of prime farmland to urban and industrial uses. The loss of prime farmland to other uses puts pressure on lands that are less productive than prime farmland.

About 80,629 acres, or nearly 4.2 percent of the survey area, would meet the requirements for prime farmland if an adequate and dependable supply of irrigation water were available.

The map units in the survey area that meet the requirements for prime farmland are listed under "Prime Farmland Map Units." On some soils included in the list, measures that overcome limitations are needed. The location of each map unit is shown on the detailed soil maps at the back of this publication. This list does not constitute a recommendation for a particular land use.

### Unique Farmland

Unique farmland is land other than prime farmland that is used for the production of specific high-value food and fiber crops. It has the special combination of soil qualities, location, growing season, and moisture supply needed for the economic production of sustained high yields of a specific high-quality crop when treated and managed by acceptable farming methods. Examples of such crops are citrus, tree nuts, olives, cranberries, and vegetables.

Unique farmland is used for a specific high-value food or fiber crop; has an adequate supply of available moisture for the specific crop because of stored moisture, precipitation, or irrigation; and has a combination of soil qualities, growing season, temperature, humidity, air drainage, elevation, aspect, and other factors, such as nearness to markets, that favor the production of a specific food or fiber crop.

Lists of unique farmland are developed as needed in cooperation with conservation districts and other entities. There are presently no soils recognized as unique farmland in Nevada.



### **Additional Farmland of Statewide Importance**

Some areas other than areas of prime and unique farmland are of statewide importance in the production of food, feed, fiber, forage, and oilseed crops. The criteria used in defining and delineating these areas are determined by the appropriate State agency or agencies. Generally, additional farmland of statewide importance includes areas that nearly meet the criteria for prime farmland and that economically produce high yields of crops when treated and managed by acceptable farming methods. Some areas can produce as high a yield as areas of prime farmland if conditions are favorable. In some states, additional farmland of statewide importance may include tracts of land that have been designated for agriculture by State law.

Nevada has designated any farmland that is irrigated to be of statewide importance.

### **Prime Farmland Map Units**

The following map units are prime farmland where irrigated with an adequate and dependable water supply:

- 161 Sonoma silt loam, drained, 0 to 2 percent slopes
- 1135 Clementine-Clurde association
- 1155 Clurde very fine sandy loam, 0 to 2 percent slopes
- 2541 Kelk very fine sandy loam, occasionally flooded, 0 to 2 percent slopes
- 2545 Kelk-Clurde association
- 2611 Dacker-Hunnton association
- 2612 Dacker-Zevadez association
- 2652 Wieland-Dacker-Zevadez association
- 2777 Zevadez-Wieland-Clurde association

# Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories. Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. Table 20, "Classification of the Soils," in Part II of this Publication shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

**ORDER.** Eleven soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Mollisol.

**SUBORDER.** Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Xeroll (*Xer*, meaning *xeric*, plus *oll*, from *Mollisol*).

**GREAT GROUP.** Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Argixeroll. (*Argi*, meaning *presence of argillic horizon*, plus *xeroll*, the suborder of the *Mollisols* that have a *xeric* moisture regime).

**SUBGROUP.** Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Argixerolls.

**FAMILY.** Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineral content, temperature regime, thickness of the root zone, consistence,

moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is loamy-skeletal, mixed, frigid, Typic Argixerolls.

**SERIES.** The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. The texture of the surface layer or of the substratum can differ within a series.

## Taxonomic Units and Their Morphology

In this section, each taxonomic unit recognized in the survey area is described. The descriptions are arranged in alphabetical order.

Characteristics of the soil and the material in which it formed are identified for each unit. A pedon, a small three-dimensional area of soil, that is typical of the unit in the survey area is described. The detailed description of each soil horizon follow standards in the "Soil Survey Manual" (18). Many of the technical terms used in the descriptions are defined in "Soil Taxonomy" (20). Unless otherwise stated, colors in the descriptions are for dry soil. Following the pedon description is the range of important characteristics of the soils in the unit.

The map units of each taxonomic unit are described in the section "Detailed Soil Map Units."

### Akler Series

The Akler series consists of shallow, well drained soils that formed in residuum from tuff. Akler soils are on hills and mountains. Slopes are 4 to 15 percent. The mean annual precipitation is about 12 inches and the mean annual temperature is about 44 degrees F.

**Taxonomic class:** Clayey, montmorillonitic, frigid, shallow Xerollic Haplargids

**Typical pedon:** Akler loam, 4 to 15 percent slopes, is located in an area of map unit 308. (Colors are for dry soil unless otherwise noted.)

A--0 to 4 inches; light brownish gray (10YR 6/2) loam, dark grayish brown (10YR 4/2) moist; weak medium platy structure; slightly hard, very friable, sticky and



plastic; many very fine and fine, few medium and coarse roots; common very fine vesicular pores and few very fine tubular pores; 5 percent pebbles and 5 percent cobbles; neutral (pH 7.0); abrupt wavy boundary. (1 to 6 inches thick)

Bt1--4 to 12 inches; brown (10YR 5/3) clay, brown (10YR 4/3) moist; strong coarse prismatic structure; very hard, very firm, very sticky and very plastic; few very fine and fine roots; common very fine tubular pores; many stress surfaces along faces of peds; 5 percent pebbles; neutral (pH 7.2); clear wavy boundary. (6 to 14 inches thick)

Bt2--12 to 16 inches; light yellowish brown (10YR 6/4) clay, yellowish brown (10YR 5/4) moist; weak coarse prismatic structure parting to strong coarse subangular blocky; very hard, friable, very sticky and very plastic; few very fine and fine roots; moderate very fine tubular pores; many stress surfaces along faces of peds; 5 percent pebbles; mildly alkaline (pH 7.6); clear wavy boundary. (0 to 6 inches thick)

Bt3--16 to 18 inches; light yellowish brown (10YR 6/4) clay, yellowish brown (10YR 5/4) moist; moderate fine subangular blocky structure; hard, friable, very sticky and very plastic; few very fine and fine roots; common very fine tubular pores; many stress surfaces along faces of peds; 5 percent pebbles; mildly alkaline (pH 7.6); clear wavy boundary. (0 to 4 inches thick)

Cr--18 inches; fractured weathered tuff; few moderately thick clay films, few fine, irregularly shaped filaments and threads of lime along fracture planes, and few fine and medium roots along fracture planes.

**Type location:** Elko County, Nevada; approximately 6 miles southeast of Willow Creek Reservoir; about 600 feet east and 400 feet south of the northwest corner of section 19, T. 38 N., R. 48 E.; 40 degrees, 09 minutes, 47 seconds north latitude, 116 degrees, 35 minutes, 12 seconds west longitude.

#### Range in Characteristics

**Soil moisture:** Usually dry; moist in the winter and spring, dry mid June through October

**Soil temperature:** 44 to 47 degrees F.

**Depth to paralithic contact:** 14 to 20 inches.

**Reaction:** Neutral or mildly alkaline

**Control section:**

Clay content--50 to 60 percent.

Rock fragments--0 to 15 percent, mainly pebbles, some pedons near rock outcrops have cobbles in their profile.

**A horizon:**

Value--5 or 6 dry, 3 or 4 moist.

Chroma--2 or 3.

**Bt horizons:**

Hue--2.5Y or 10YR.

Value--5 or 6 dry, 3 through 5 moist.

Chroma--2 through 4.

**Cr horizon:**

Clay films--Common in upper horizon along fracture planes.

## Alley Series

The Alley series consists of very deep, well drained soils that formed in loess over alluvium and colluvium from andesite, basalt and tuff with some influence from loess. Alley soils are on side slopes and shoulders of plateaus, hills and fan piedmont remnants. Slopes are 8 to 75 percent. The mean annual precipitation is about 9 inches and the mean annual air temperature is about 47 degrees F.

**Taxonomic class:** Fine-loamy, mixed, mesic Durixerollic Haplargids

**Typical pedon:** Alley very stony loam, 15 to 30 percent slopes, is located in an area of map unit 235.

(Colors are for dry soil unless otherwise noted.) The surface is covered with approximately 15 percent pebbles, 10 percent cobbles and 10 percent stones.

A1--0 to 3 inches; pale brown (10YR 6/3) very stony loam, brown (10YR 4/3) moist; moderate very thin platy structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine and fine vesicular pores; 15 percent pebbles, 10 percent cobbles and 10 percent stones; neutral (pH 7.2); clear smooth boundary. (2 to 8 inches thick)

A2--3 to 7 inches; pale brown (10YR 6/3) very stony loam, brown (10YR 4/3) moist; moderate very thick platy structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine and fine vesicular pores; 15 percent pebbles, 10 percent cobbles and 10 percent stones; neutral (pH 7.2); clear smooth boundary. (0 to 5 inches thick)

Bt1--7 to 11 inches; light yellowish brown (10YR 6/4) gravelly loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine, common fine and medium roots; common very fine tubular pores; few thin clay films on faces of peds and lining pores; 15 percent pebbles, 5 percent cobbles; mildly alkaline (pH 7.8); clear smooth boundary.

Bt2--11 to 20 inches; light yellowish brown (10YR 6/4) gravelly clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium and coarse subangular blocky structure; hard, firm, sticky and slightly plastic; common very fine and few fine roots;

common very fine tubular pores; common thin clay films on faces of peds and lining pores; 20 percent pebbles; moderately alkaline (pH 8.0); clear smooth boundary. (4 to 9 inches thick)

Bqk1--20 to 28 inches; very pale brown (10YR 7/4) gravelly fine sandy loam, yellowish brown (10YR 5/4) moist; weak fine subangular blocky structure; hard, firm and brittle when moist, slightly sticky and slightly plastic; common very fine roots; common very fine tubular pores; continuously brittle matrix; slightly effervescent, lime is disseminated; 30 percent pebbles; moderately alkaline (pH 8.4); clear smooth boundary. (6 to 10 inches thick)

Bqk2--28 to 40 inches; very pale brown (10YR 7/4) gravelly fine sandy loam, yellowish brown (10YR 5/4) moist; massive; hard, firm and brittle moist, slightly sticky and nonplastic; few very fine roots; common very fine tubular pores; continuous brittle matrix; strongly effervescent, lime is disseminated; 25 percent pebbles, 10 percent cobbles; moderately alkaline (pH 8.2); clear smooth boundary. (0 to 14 inches thick)

2Bk--40 to 60 inches; light gray (10YR 7/2) very cobbly fine sandy loam, grayish brown (10YR 5/2) very cobbly fine sandy loam, grayish brown (10YR 5/2) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine roots; few very fine tubular pores; strongly effervescent; 25 percent pebbles; 15 percent cobbles; strongly alkaline (pH 8.6); (15 to 30 inches thick)

**Type location:** Elko County, Nevada; approximately 1.5 miles south of Rock Creek Ranch; about 200 feet north and 1,600 feet east of the southwest corner of section 25, T. 37 N., R. 46 E.; 41 degrees, 02 minutes, 57 seconds north latitude, 116 degrees, 44 minutes, 02 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Usually dry; moist in the winter and spring months, dry summer and fall

*Soil temperature:* 47 to 52 degrees F.

*Depth to continuous brittle matrix:* 16 to 30 inches.

*Depth to carbonates:* 16 to 22 inches.

*Other features:* Few to many, fine to coarse lime segregations are common in most pedons where depth to the Bqk horizon is greater than 22 inches.

#### A horizons:

Value--5 or 6 dry, 3 or 4 moist.

Chroma--2 or 3.

Reaction--Neutral or mildly alkaline.

Other features--When mixed, the upper 7 inches has color values greater than 5.5 dry and 3.5 moist.

#### Bt horizons:

Value--5 or 6 dry, 4 or 5 moist.

Chroma--2 through 4.

Texture--Gravelly loam, gravelly clay loam or gravelly sandy clay loam.

Clay content--20 to 30 percent.

Rock fragments--15 to 30 percent, mainly pebbles.

Structure--Weak or moderate, fine to coarse subangular blocky.

Reaction--Mildly alkaline or moderately alkaline.

#### Bqk horizons:

Value--6 through 8 dry, 4 through 6 moist.

Chroma--1 through 4.

Texture--Gravelly fine sandy loam, gravelly sandy loam, or cobbly fine sandy loam.

Rock fragments--15 to 35 percent, mainly pebbles or cobbles.

Consistence--Hard or very hard.

Reaction--Moderately alkaline or strongly alkaline.

Silica cementation--Few thin, or very thin discontinuous silica laminae are common in some pedons. Some pedons commonly have durinodes in a friable matrix below the continuously brittle matrix.

#### 2Bk horizon (when present):

Rock fragments--40 to 60 percent, when mixed, mostly pebbles and cobbles, few stones in some pedons.

### Alyan Series

The Alyan series consists of moderately deep, well drained soils that formed in residuum and colluvium from igneous rocks and siliceous tuff. Alyan soils are on hills, mountains and plateaus. Slopes are 4 to 50 percent. The mean annual precipitation is about 12 inches and the mean annual temperature is about 44 degrees F.

**Taxonomic class:** Fine, montmorillonitic, frigid Aridic Argixerolls

**Typical pedon:** Alyan gravelly loam, 30 to 50 percent slopes, located in an area of map unit 2001. (Colors are for dry soil unless otherwise noted.)

A1--0 to 2 inches; grayish brown (10YR 5/2) gravelly loam, very dark grayish brown (10YR 3/2) moist; weak fine through coarse subangular blocky structure; soft, very friable, sticky and plastic; many very fine and fine, few medium roots; many very fine tubular and irregular pores; 25 percent pebbles; neutral (pH 7.0); abrupt smooth boundary. (1 to 5 inches thick)

A2--2 to 9 inches; dark grayish brown (10YR 4/2) gravelly loam, very dark brown (10YR 2/2) moist; weak medium subangular blocky structure; soft, very friable, sticky and plastic; few very fine and fine roots; many very fine, few fine and medium



- tubular pores; 25 percent pebbles; neutral (pH 7.2); clear wavy boundary. (3 to 12 inches thick)
- Bt1--9 to 16 inches; brown (10YR 5/3) clay, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; hard, firm, very sticky and very plastic; few very fine and fine roots; many very fine through medium tubular pores; common thin clay films bridging sand grains and as colloid stains on pebbles; 10 percent pebbles; neutral (pH 7.2); clear wavy boundary. (3 to 8 inches thick)
- Bt2--16 to 28 inches; yellowish brown (10YR 5/4) gravelly clay, dark yellowish brown (10YR 4/4) moist; moderate medium and coarse subangular blocky structure; very hard, firm, very sticky and very plastic; few very fine and fine roots; common very fine through medium tubular pores; many thin and common moderately thick clay films on faces of peds, lining pores, bridging sand grains and as colloid stains on pebbles; 30 percent pebbles; neutral (pH 7.2); clear wavy boundary. (4 to 18 inches thick)
- Bt3--28 to 32 inches; light yellowish brown (10YR 6/4) very gravelly clay, yellowish brown (10YR 5/4) moist; massive; very hard, firm, very sticky and very plastic; few very fine roots; common very fine and fine tubular pores; common thick clay films bridging sand grains and as colloid stains on pebbles; 40 percent pebbles; neutral (pH 7.2). (0 to 5 inches thick)
- R--32 inches; siliceous tuff.

**Type location:** Elko County, Nevada; approximately 1 mile east of Midas; about 600 feet west and 1,200 feet north of the southeast corner section 21, T. 39 N., R. 46 E.; 41 degrees, 14 minutes, 25 seconds north latitude, 116 degrees, 46 minutes, 44 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Moist in winter and spring, dry from mid June to mid October

*Soil temperature:* 44 to 47 degrees F.

*Mollic epipedon thickness:* 8 to 18 inches thick, and commonly includes the upper part of the argillic horizon.

*Depth to bedrock:* 20 to 40 inches.

*Thickness of the A & Bt horizons:* 20 to 40 inches.

*Control section:*

Clay content--40 to 55 percent.

Rock fragments--Average 15 to 35 percent, mainly pebbles.

#### A horizons:

Value--4 or 5 dry, 2 or 3 moist.

Chroma--2 or 3.

Reaction--Neutral or mildly alkaline.

#### Bt horizons:

Hue--10YR or 7.5YR.

Value--5 through 7 dry, 3 through 5 moist, with darker value common only in the upper subhorizon.

Chroma--2 through 4.

Texture--Clay or gravelly clay with thin subhorizons of very gravelly clay overlying the bedrock common in most pedons. Thin gravelly clay loam subhorizons are common in some pedons.

Structure--Subangular blocky or is massive.

Consistence--Friable or firm, moist; sticky or very sticky and plastic or very plastic, wet.

Reaction--Neutral or mildly alkaline.

## Arcia Series

The Arcia series consists of moderately deep, well drained soils that formed in colluvium from tuff and basalt. The Arcia soils are on side slopes of hills and mountains. Slopes are 15 to 50 percent. The mean annual precipitation is about 14 inches and the mean annual temperature is about 43 degrees F.

**Taxonomic class:** Fine, montmorillonitic, frigid Pachic Argixerolls

**Typical pedon:** Arcia gravelly silt loam, 15 to 30 percent slopes is located in an area of map unit 1876. (Colors are for dry soil unless otherwise noted.)

A1--0 to 2 inches; dark grayish brown (10YR 4/2) silt loam, very dark brown (10YR 2/2) moist; moderate fine granular structure; slightly hard, very friable, sticky and slightly plastic; many very fine and fine roots; common very fine interstitial pores; 5 percent pebbles; neutral (pH 7.0); clear wavy boundary. (1 to 12 inches thick)

A2--2 to 6 inches; dark grayish brown (10YR 4/2) silt loam, very dark grayish brown (10YR 3/2) moist; moderate fine granular structure; hard, very friable, very sticky and plastic; many very fine, common fine and few medium roots; common very fine tubular and interstitial pores; 5 percent pebbles; neutral (pH 7.0); clear wavy boundary. (2 to 8 inches thick)

A3--6 to 15 inches; dark grayish brown (10YR 4/2) silt loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure; hard, very friable, very sticky and plastic; common very fine and fine, few medium roots; many very fine tubular pores; 5 percent pebbles; neutral (pH 7.0); clear wavy boundary. (0 to 9 inches thick)

Bt1--15 to 21 inches; grayish brown (10YR 5/2) clay loam, very dark grayish brown (10YR 3/2) moist; moderate coarse subangular blocky structure; hard, friable, very sticky and very plastic; common very fine and fine, few medium roots; many very fine tubular pores; few thin clay films bridging sand grains and as colloidal stains on coarse fragments;

10 percent pebbles; neutral (pH 7.0); abrupt wavy boundary. (5 to 10 inches thick)

Bt2--21 to 27 inches; yellowish brown (10YR 5/4) gravelly clay, brown (10YR 4/3) moist; moderate coarse subangular blocky structure; very hard, firm, very sticky and very plastic; few very fine and fine roots; many very fine and few fine tubular pores; continuous moderately thick clay films on faces of peds and as colloidal stains on coarse fragments; 20 percent pebbles; neutral (pH 7.2); clear wavy boundary. (6 to 20 inches thick)

Bt3--27 to 33 inches; yellowish brown (10YR 5/4) gravelly clay, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; hard, friable, very sticky and very plastic; few very fine and fine roots; many very fine and few fine tubular pores; common moderately thick clay films on faces of peds, lining pores and as colloidal stains on coarse fragments; 20 percent pebbles; neutral (pH 7.2); clear wavy boundary. (0 to 8 inches thick)

Bt4--33 to 39 inches; yellowish brown (10YR 5/4) gravelly clay, dark yellowish brown (10YR 4/4) moist; massive; hard, friable, sticky and plastic; few very fine roots; many very fine and few fine tubular pores; 25 percent pebbles; neutral (pH 7.2); abrupt smooth boundary. (0 to 8 inches thick)

R--39 inches; hard, rhyolite.

**Type location:** Elko County, Nevada; about 3 miles south of Deep Creek Reservoir; 530 feet north and 1,320 feet west of the southwest corner of section 7, T. 42 N., R. 51 E.; 41 degrees, 32 minutes, 50 seconds north latitude, 116 degrees, 17 minutes, 42 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Moist winter and spring, dry mid July through early October

*Soil temperature:* 42 to 47 degrees F.

*Mollic epipedon thickness:* 20 to 30 inches; includes the upper argillic horizon.

*Solum thickness and depth to bedrock:* 30 to 40 inches.

#### Control section:

Clay content--Averages 35 to 50 percent.

Rock fragments--Averages 5 to 20 percent, mainly pebbles with some cobbles.

#### A horizons:

Value--4 or 5 dry, 2 or 3 moist.

Chroma--1 through 3.

#### Bt1 horizon:

Value--4 or 5 dry, 2 or 3 moist.

Chroma--1 through 3.

Texture--Clay loam or gravelly clay loam.

Clay content--30 to 40 percent.

Rock fragments--0 to 30 percent, mainly pebbles.

#### Lower Bt subhorizons:

Value--5 or 6 dry, 3 or 4 moist.

Chroma--2 through 4 with lower chroma typically in the upper subhorizons.

Clay content--40 to 60 percent.

Rock fragments--Average 5 to 35 percent mainly pebbles and cobbles.

Texture--Clay, gravelly clay, cobbly clay. It is common to find a very cobbly clay with 35 to 50 percent rock fragments in most pedons immediately above the lithic contact.

### Bartome Series

The Bartome series consists of shallow over a duripan, well drained soils that formed in alluvium from mixed sources with a thin loess cap. Bartome soils are on fan piedmont remnants. Slopes are 0 to 4 percent. Mean annual precipitation is about 9 inches and mean annual temperature is about 47 degrees F.

**Taxonomic class:** Loamy, mixed, mesic, shallow Xerollic Durargids

**Typical pedon:** Bartome very fine sandy loam, 0 to 2 percent slopes, is located in an area of map unit 2807. (Colors are for dry soil unless otherwise noted.)

A1--0 to 2 inches; pale brown (10YR 6/3) very fine sandy loam, brown (10YR 4/3) moist; moderate coarse and very coarse platy structure; slightly hard, very friable, slightly sticky and nonplastic; common fine and few very fine roots; common coarse and many medium vesicular pores; mildly alkaline (pH 7.8); clear smooth boundary. (1 to 3 inches thick)

A2--2 to 5 inches; pale brown (10YR 6/3) very fine sandy loam, brown (10YR 4/3) moist; weak fine platy structure; soft, very friable, slightly sticky and nonplastic; common fine and very fine roots; few medium and common fine vesicular pores; mildly alkaline (pH 7.8); clear wavy boundary. (1 to 4 inches thick)

A3--5 to 7 inches; yellowish brown (10YR 5/4) silt loam, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure; soft, friable, slightly sticky and slightly plastic; few medium and common fine roots; few medium and common fine tubular pores; moderately alkaline (pH 8.0); clear wavy boundary. (0 to 4 inches thick)

Bt--7 to 11 inches; pale brown (10YR 6/3) silty clay loam, brown (10YR 5/3) moist; moderate medium and coarse subangular blocky structure; slightly hard, firm, sticky and plastic; few medium and fine roots; few medium and fine tubular pores; few thin clay films on peds, common moderately thick clay films lining pores; moderately alkaline (pH 8.2); gradual wavy boundary. (4 to 7 inches thick)

Bqk--11 to 14 inches; pale brown (10YR 6/3) silty clay loam, yellowish brown (10YR 5/4) moist; strong



coarse and very coarse platy structure; hard, firm, sticky and plastic; few fine roots; few fine tubular pores; 5 percent pebbles; 15 percent brittle durinodes; few fine soft masses of lime, strongly alkaline (pH 8.6); gradual wavy boundary. (0 to 8 inches thick)

Bqkm1--14 to 24 inches; very pale brown (10YR 7/3) fractured indurated duripan, light yellowish brown (10YR 6/4) moist; strong coarse platy structure; very hard, extremely firm; few fine roots; few fine tubular pores; 35 percent brittle durinodes in the matrix between fractures; common, fine lime in soft masses and seams; strongly effervescent; strongly alkaline (pH 9.0); clear smooth boundary. (1 to 10 inches thick)

Bqkm2--24 to 28 inches; very pale brown (10YR 7/3) indurated duripan, light yellowish brown (10YR 6/4) moist; massive; extremely hard, extremely firm; continuous silica laminae are 1/2 to 2 millimeters thick; violently effervescent; very strongly alkaline (pH 9.2); clear wavy boundary. (4 to 17 inches thick)

Bqkm3--28 to 42 inches; very pale brown (10YR 7/3) strongly cemented duripan, light yellowish brown (10YR 6/4) moist; massive; very hard, extremely firm; 25 percent brittle durinodes; violently effervescent; moderately alkaline (pH 8.4)

**Type location:** Owyhee Desert, Elko County, Nevada; in an unsectionized area, about 3,000 feet north and 1,800 feet west of the Desert Ranch; 41 degrees, 44 minutes, 9 seconds north latitude, 116 degrees, 33 minutes, 25 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Usually dry; moist in winter and spring, dry in summer and early autumn

*Soil temperature:* 47 to 51 degrees F.

*Depth to base of Bt horizon:* 10 to 14 inches.

*Reaction:* Neutral to strongly alkaline in solum.

*Depth to indurated duripan:* 14 to 20 inches.

*Depth to bedrock:* Greater than 60 inches.

*Control section:*

Clay content--18 to 26 percent.

Rock fragments--0 to 15 percent, mainly pebbles.

#### A horizons:

Value--5 or 6 dry; 4 or 5 moist.

Chroma--2 through 4.

#### Bt horizon:

Value--5 or 6 dry, 4 or 5 moist.

Chroma--3 or 4.

Clay content--27 to 35 percent.

Structure--Weak or moderate, fine, medium or coarse subangular blocky.

Consistence--Friable or firm moist.

#### Bqk horizons (when present):

Value--6 or 7 dry, 4 through 6 moist.

Chroma--3 or 4.

Texture--Silt loam, loam, silty clay loam, sandy loam.

Rock fragments--5 to 25 percent.

Consistence--Slightly hard or hard dry, friable or firm moist, slightly sticky or sticky and slightly plastic or plastic wet.

## Bilbo Series

The Bilbo series consists of very deep, well drained soils that formed in alluvium from mixed rock sources. Bilbo soils occur on side slopes of fan piedmont remnants and plateaus. Slopes are 4 to 50 percent. The mean annual precipitation is about 10 inches and the mean annual temperature is about 47 degrees F.

**Taxonomic class:** Clayey-skeletal, montmorillonitic, mesic Xerollic Haplargids

**Typical pedon:** Bilbo very gravelly very fine sandy loam, 15 to 50 percent slopes, is located in map unit 2514. (Colors are for dry soil unless otherwise noted.) The soil surface is partially covered with 10 percent cobbles and 30 percent pebbles.

A1--0 to 3 inches; pale brown (10YR 6/3) very gravelly very fine sandy loam, dark brown (10YR 3/3) moist; weak thick platy structure; soft, very friable, nonsticky and nonplastic; common fine and very fine vesicular pores; common fine and very fine roots; 10 percent cobbles, 30 percent pebbles; mildly alkaline (pH 7.8); clear wavy boundary. (2 to 4 inches thick)

A2--3 to 5 inches; pale brown (10YR 6/3) very gravelly very fine sandy loam, dark brown (10YR 3/3) moist; weak medium platy structure; soft, very friable, nonsticky and nonplastic; common fine and very fine, few medium roots; common fine and very fine vesicular and few medium tubular pores; 10 percent cobbles, 25 percent pebbles; mildly alkaline (pH 7.8); clear wavy boundary. (2 to 4 inches thick)

Bt1--5 to 10 inches; brown (10YR 5/3) very gravelly sandy clay, brown (10YR 4/3) moist; moderate fine subangular blocky structure; slightly hard, firm, sticky and plastic; common fine, few very fine roots; common fine, few very fine interstitial pores; common thin clay films on faces of peds and as bridges; 15 percent cobbles, 40 percent pebbles; mildly alkaline (pH 7.6); gradual wavy boundary. (0 to 6 inches thick)

Bt2--10 to 20 inches; yellowish brown (10YR 5/4) very gravelly sandy clay, dark yellowish brown (10YR 4/4) moist; moderate fine prismatic parting to moderate fine subangular blocky structure; hard, very firm, very sticky and very plastic; common fine roots; common fine interstitial pores; common

moderately thick clay films on faces of peds and as bridges; 15 percent cobbles, 30 percent pebbles; mildly alkaline (pH 7.8); gradual wavy boundary. (6 to 12 inches thick)

Bt3--20 to 32 inches; yellowish brown (10YR 5/4) very gravelly sandy clay, dark yellowish brown (10YR 4/4) moist; moderate fine subangular blocky structure; hard, firm, sticky and plastic; few fine roots; few fine pores; common thin clay films on faces of peds and as bridges; 15 percent cobbles, 35 percent pebbles; mildly alkaline (pH 7.8); gradual wavy boundary. (4 to 12 inches thick)

Bt4--32 to 40 inches; light yellowish brown (10YR 6/4) very gravelly sandy clay loam, dark yellowish brown (10YR 4/4) moist; weak fine subangular blocky structure; hard, firm, sticky and plastic; few fine roots; few fine interstitial pores; few thin clay films lining pores and as bridges; 15 percent cobbles; 40 percent pebbles; mildly alkaline (pH 7.8); gradual wavy boundary. (0 to 20 inches thick)

Bk--40 to 60 inches; pale brown (10YR 6/3) very gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; massive; soft, friable, nonsticky and nonplastic; 35 percent pebbles; strongly effervescent with lime as fine soft masses; moderately alkaline (pH 8.0).

**Type location:** Elko County, Nevada; in an unsectionized area, about 3 miles west of IL Ranch; 41 degrees, 34 minutes, 10 seconds north latitude, 116 degrees, 27 minutes, 20 seconds west longitude.

#### Range in Characteristics

**Soil moisture:** Moist in winter and spring, dry June through October

**Soil temperature:** 47 to 51 degrees F.

**Combined thickness of A and Bt horizons:** 20 to 40 inches.

**Depth to carbonates:** 20 to 40 inches.

**Reaction:** Neutral to moderately alkaline, normally increasing with depth.

**Other features:** Transitional A/B or E/B horizons are in some pedons.

#### Control section:

Clay content--35 to 50 percent.

Rock fragments--35 to 60 percent, mainly pebbles with up to 20 percent cobbles in some pedons.

#### A horizons:

Value--5 or 6 dry, 3 or 4 moist.

Chroma--2 or 3.

#### Bt horizons:

Hue--7.5YR or 10YR.

Value--5 or 6 dry, 3 through 5 moist.

Chroma--2 through 4.

Texture--Very gravelly clay, very gravelly sandy clay loam, very gravelly sandy clay, very gravelly clay loam.

Structure--Prismatic, subangular or angular blocky or is massive in the lower part.

Consistence--Slightly hard to very hard dry; friable to very firm moist; sticky or very sticky and plastic or very plastic, wet.

#### Bk horizon:

Value--5 through 8 dry, 4 through 6 moist.

Chroma--2 through 4.

Texture--Extremely gravelly loamy sand or very gravelly sandy loam.

Rock fragments--35 to 75 percent, mainly pebbles.

Consistence--Loose to slightly hard, dry; loose to firm, moist.

### Bioya Series

The Bioya series consists of moderately deep, well drained soils formed in loess over alluvium from volcanic rock sources. They are on summits and side slopes of fan piedmont remnants and plateaus. Slopes are 0 to 15 percent. The mean annual precipitation is about 9 inches and the mean annual temperature is about 47 degrees F.

**Taxonomic class:** Fine-loamy, mixed, mesic Xerollic Durorthids

**Typical pedon:** Bioya very fine sandy loam, 0 to 2 percent slopes located in an area of map unit 236. (Colors are for dry soil unless otherwise noted.) Approximately 2 percent pebbles covers the surface.

A1--0 to 6 inches; pale brown (10YR 6/3) very fine sandy loam, brown (10YR 4/3) moist; strong very fine platy structure; soft, very friable, nonsticky and slightly plastic; common very fine and few fine roots; many very fine and few fine vesicular pores; 2 percent pebbles; mildly alkaline (pH 7.6); clear smooth boundary. (3 to 7 inches thick)

A2--6 to 10 inches; light yellowish brown (10YR 6/4) silt loam, brown (10YR 4/3) moist; strong very fine platy structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots; few very fine tubular pores; 2 percent pebbles; mildly alkaline (pH 7.6); clear smooth boundary. (2 to 10 inches thick)

Bq1--10 to 14 inches; light yellowish brown (10YR 6/4) silt loam, dark brown (10YR 3/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few fine and medium roots; common very fine tubular pores; few thin silica coatings on faces of peds; 2 percent pebbles; mildly alkaline (pH 7.8); gradual smooth boundary. (0 to 5 inches thick)

Bq2--14 to 19 inches; light yellowish brown (10YR 6/4) silt loam, dark brown (10YR 4/3) moist;



massive; hard, firm slightly sticky and slightly plastic; few very fine roots; few very fine and fine tubular pores; common thin silica coatings on faces of peds; 30 percent hard firm 5 to 10 millimeter durinodes; 1 percent pebbles; mildly alkaline (pH 7.8); clear smooth boundary. (0 to 7 inches thick)

Bqk1--19 to 31 inches; light yellowish brown (10YR 6/4) silt loam, dark yellowish brown (10YR 4/4) moist; massive; hard, firm, slightly sticky and slightly plastic; few very fine roots; few very fine tubular pores; common thin silica coatings on faces of peds; 30 percent hard, firm 5 to 10 millimeter durinodes; slightly effervescent with disseminated lime; 1 percent pebbles; moderately alkaline (pH 8.0); clear smooth boundary. (9 to 20 inches thick)

Bqk2--31 to 36 inches; very pale brown (10YR 7/3) loam, light yellowish brown (10YR 6/4) moist; massive; very hard, very firm, slightly sticky and slightly plastic; few very fine tubular pores; weak discontinuous silica cementation; many thin silica coatings on faces of peds, 30 percent firm 5 to 10 millimeter durinodes; strongly effervescent; many fine lime filaments; 1 percent pebbles; strongly alkaline (pH 8.6) abrupt smooth boundary. (4 to 8 inches thick)

Bqkm--36 to 60 inches; very pale brown (10YR 8/3); indurated duripan, massive.

**Type location:** Elko County, Nevada; approximately 4.5 miles south of Midas; about 650 feet north and 1,600 feet east of the southwest corner of Section 10, T. 38 N., R 46 E.; 41 degrees, 10 minutes, 43 seconds north latitude, 116 degrees, 46 minutes, 17 seconds west longitude.

#### Range in Characteristics

**Soil moisture:** Usually dry; moist in winter and spring, dry from mid June to November

**Soil temperature:** 47 to 52 degrees F.

**Depth to Bqk horizons:** 8 to 19 inches.

**Depth to indurated duripan:** 20 to 40 inches.

**Other features:** Some pedons have a Bq horizons that lack carbonates and have value of 6 through 8 dry.

**Control section:**

Clay content--18 to 27 percent.

#### A horizons:

Value--5 or 6 dry, 3 through 5 moist. (More than 5.5 dry and 3.5 moist when the surface 7 inches are mixed.)

Chroma--2 through 4.

Reaction--Mildly alkaline to moderately alkaline.

#### Bqk horizons:

Value--6 through 8 dry, 4 through 6 moist.

Chroma--3 through 6.

Texture--Silt loam, or loam.

Structure--Subangular blocky or is massive.

Reaction--Mildly alkaline to very strongly alkaline.  
Other features--20 to 50 percent durinodes or is discontinuously weakly silica cemented.

#### Bqkm horizons:

Structure--Thick or very thick platy, or is massive.

### Blitzen Series

The Blitzen series consists of moderately deep, well drained soils that formed in residuum and colluvium from mixed rocks. Blitzen soils are on south facing hill and mountain side slopes. Slopes are 15 to 75 percent. Mean annual precipitation is about 13 inches and mean annual temperature is about 43 degrees F.

**Taxonomic class:** Clayey-skeletal, montmorillonitic, frigid Aridic Argixerolls

**Typical pedon:** Blitzen gravelly clay loam, 15 to 50 percent slopes, located in an area of map unit 1881. (Colors are for dry soil unless otherwise noted.)

Al--0 to 4 inches; grayish brown (10YR 5/2) gravelly clay loam, very dark gray (10YR 3/1) moist; moderate fine and medium subangular blocky structure; soft, very friable, sticky and plastic; common very fine, fine and few medium roots; many very fine and fine vesicular and common fine tubular pores; 20 percent pebbles; neutral (pH 7.2); clear smooth boundary. (3 to 4 inches thick)

A2--4 to 10 inches; brown (10YR 5/3) gravelly clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium and coarse subangular blocky structure; slightly hard, very friable, sticky and plastic; many very fine and fine roots; common very fine, fine and few medium tubular pores; 30 percent pebbles; mildly alkaline (pH 7.4); clear smooth boundary. (4 to 6 inches thick)

Bt1--10 to 17 inches; yellowish brown (10YR 5/4) very gravelly clay, brown (10YR 4/3) moist; moderate medium and coarse subangular blocky structure; slightly hard, friable, very sticky and plastic; common very fine, fine and few medium roots; many very fine and fine tubular pores; common thin clay films on faces of peds and lining pores; 35 percent pebbles; mildly alkaline (pH 7.4); clear smooth boundary. (5 to 10 inches thick)

Bt2--17 to 24 inches; light yellowish brown (10YR 6/4) very gravelly clay, brown (10YR 4/3) moist; strong, medium and coarse subangular blocky structure; hard, firm, very sticky and very plastic; few fine roots; many very fine and fine tubular pores; many thin clay films on faces of peds; many colloidal stains on mineral grains; 45 percent pebbles; neutral (pH 7.2); clear irregular boundary. (4 to 9 inches thick)

Bt3--24 to 33 inches; yellowish brown (10YR 5/4) very gravelly clay, dark yellowish brown (10YR 4/4)

moist; strong medium and coarse angular blocky structure; hard, firm, very sticky and very plastic; few fine roots; common fine tubular pores; many pressure faces, common thick clay films lining pores; 55 percent pebbles; mildly alkaline (pH 7.4); abrupt wavy boundary. (4 to 11 inches thick)  
Cr--33 inches; soft weathered tuff.

**Type location:** Elko County, Nevada; approximately 13 miles north of Tuscarora, adjacent to the south fork of the Owyhee River; about 300 feet south and 500 feet west of the northeast corner of section 12, T. 41 N., R. 51 E.; 41 degrees, 28 minutes, 15 seconds north latitude, 116 degrees, 11 minutes, 5 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Moist in winter and spring, dry mid-July through October

*Soil temperature:* 42 to 47 degrees F.

*Mollic epipedon thickness:* 7 to 10 inches.

*Reaction:* Neutral or mildly alkaline.

*Soil thickness and depth to paralithic contact:* 20 to 40 inches.

*Control section:*

Clay content--35 to 60 percent.

Rock fragments--35 to 60 percent, mainly pebbles.

#### A horizons:

Value--4 or 5 dry, 2 or 3 moist.

Chroma--2 or 3 dry, 1 or 2 moist.

#### Bt horizons:

Value--4 through 6 dry, 3 through 5 moist.

Chroma--3 or 4.

Texture--Very gravelly clay or very gravelly clay loam.

## Booford Series

The Booford series consists of moderately deep, well drained soils on hills. These soils formed in colluvium and residuum derived mainly from andesitic volcanic ash and tuff and minor amounts of tuffaceous sedimentary rocks. Slopes are 0 to 50 percent. The mean annual precipitation is about 16 inches and the mean annual temperature is about 44 degrees F.

**Taxonomic class:** Fine, montmorillonitic, frigid Typic Argixerolls

**Typical pedon:** Booford silt loam, 15 to 50 percent slopes, is located in an area of map unit 1746. (Colors are for dry soil unless otherwise noted.)

A--0 to 10 inches; very dark gray (10YR 3/1) silt loam, black (10YR 2/1) moist; weak medium and coarse subangular blocky structure; soft, very friable,

slightly sticky and slightly plastic; common very fine and fine, few medium and coarse roots; many very fine and common fine tubular pores; 5 percent pebbles; neutral (pH 6.8); clear wavy boundary. (6 to 11 inches thick)

Bt1--10 to 19 inches; dark grayish brown (10YR 4/2) silty clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium prismatic parting to moderate coarse subangular blocky structure; slightly hard, friable, sticky and plastic; common very fine and few fine, medium and coarse roots; common very fine and fine tubular pores; common thin clay films lining pores; 5 percent pebbles; neutral (pH 6.8); clear wavy boundary. (3 to 10 inches thick)

Bt2--19 to 36 inches; brown (10YR 5/3) clay, dark brown (10YR 4/3) moist; massive; very hard, firm, very sticky and very plastic; few very fine and fine roots; few very fine tubular pores; few thin clay films lining pores; 10 percent pebbles; neutral (pH 6.6); clear smooth boundary. (12 to 20 inches thick)

Cr--36 to 52 inches; highly fractured sandstone with few thin clay films on fractures, few fine iron and manganese coating on rock fragments; few very fine and fine roots in fractures.

**Type location:** Elko County, Nevada; about 600 feet west and 1,000 feet north of the southeast corner of section 5, T. 42 N.; R. 52 E.; 41 degrees, 33 minutes, 50 seconds north latitude, 116 degrees, 08 minutes, 50 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Usually moist; moist in winter and spring, dry in late summer and fall

*Soil temperature:* 42 to 47 degrees F.

*Mollic epipedon thickness:* 7 to 19 inches thick; includes the upper part of the argillic horizon.

*Solum thickness and depth to weathered bedrock:* 20 to 40 inches.

*Reaction of profile:* Slightly acid or neutral.

#### A horizon:

Value--3 through 5 dry, 2 or 3 moist.

Chroma--1 or 2.

#### Bt1 horizon:

Hue--10YR or 7.5YR.

Value--4 or 5 dry.

Chroma--2 or 3.

Texture--Silty clay loam clay loam or clay.

Clay content--35 to 45 percent clay.

Rock fragments--5 to 25 percent.

Structure--Subangular blocky, angular blocky or prismatic.

#### Bt2 horizon:

Hue--10YR or 7.5YR.



Value--4 through 6 dry, 3 or 4 moist.  
 Chroma--3 or 4.  
 Texture--Clay, silty clay or clay loam.  
 Clay content--45 to 60 percent.  
 Rock fragment--0 to 25 percent.  
 Structure--Prismatic or is massive.

## Bregar Series

The Bregar series consists of very shallow and shallow, well drained soils that formed in residuum and colluvium from igneous flow rocks, tuff and quartzite. The Bregar soils are on hills, plateaus and mountains. Slopes are 2 to 75 percent. The mean annual precipitation is about 13 inches and the mean annual temperature is about 42 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, frigid Lithic Xerollic Haplargids

**Typical pedon:** Bregar extremely cobbly loam, 15 to 30 percent slopes, located in an area of map unit 1805. (Colors are for dry soil unless otherwise noted.) The soil surface is covered with 45 percent cobbles and 20 percent pebbles.

A1--0 to 2 inches; pale brown (10YR 6/3) extremely cobbly loam, dark brown (10YR 3/3) moist; weak medium platy structure; soft, friable, slightly sticky and slightly plastic; common very fine roots; common very fine vesicular pores; 20 percent pebbles, 45 percent cobbles, 15 percent stones; neutral (pH 7.2); clear smooth boundary. (2 to 6 inches thick)

A2--2 to 6 inches; pale brown (10YR 6/3) very gravelly loam, dark brown (10YR 3/3) moist; weak fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; few very fine tubular pores; 35 percent pebbles, 5 percent cobbles; neutral (pH 7.2); clear smooth boundary. (0 to 5 inches thick)

Bt--6 to 11 inches; brown (10YR 5/3) very gravelly clay loam, dark brown (10YR 4/3) moist; moderate fine subangular blocky structure; very hard, very firm, very sticky and very plastic; few very fine roots; few very fine tubular pores; many thin clay films lining pores and on faces of peds; 40 percent pebbles, 10 percent cobbles; neutral (pH 7.2) abrupt wavy boundary. (2 to 6 inches thick)

R--11 inches; consolidated rhyolite.

**Type location:** Elko County, Nevada; in an unsectionized area, about 5 miles east and 1.5 miles south of Lake Creek Reservoir; 41 degrees, 55 minutes, 8 seconds north latitude, 116 degrees, 50 minutes, 13 seconds west longitude.

## Range in Characteristics

**Soil moisture:** Usually dry; moist in winter and spring, dry late June through October

**Soil temperature:** 41 to 46 degrees F.

**Depth to bedrock:** 5 to 12 inches.

**Reaction:** Slightly acid through mildly alkaline.

**Other features:** The upper 3 inches of bedrock is weathered to various degrees in some pedons.

**Control section:**

Clay content--Average 18 to 30 percent

Rock fragments--Average 35 to 70 percent.

**A horizons:**

Value--5 through 7 dry, 3 or 4 moist.

Chroma--2 through 4.

**Bt horizons:**

Hue--10YR or 7.5YR.

Value--5 or 6 dry, 3 through 5 moist.

Chroma--2 through 4.

Texture--Very gravelly clay loam, extremely cobbly clay loam, very cobbly clay loam, very gravelly sandy clay loam or extremely cobbly sandy clay loam. Extremely gravelly loam or extremely cobbly loam is common in some pedons.

Clay content--25 to 35 percent.

Rock fragments--50 to 75 percent, mainly pebbles and cobbles with up to 15 percent stones.

Structure--Weak or moderate, fine or medium, angular or subangular blocky, or it is massive.

Consistence--Slightly hard to very hard dry, friable to very firm, moist; slightly sticky to very sticky, slightly plastic or very plastic wet.

Other features--Lower boundary is broken, irregular, or wavy.

## Buffaran Series

The Buffaran series consists of shallow to a duripan, well drained soils that formed in alluvium derived from mixed rock sources. Buffaran soils are on fan piedmonts, mountain valley fans, and ballenas. Slopes are 0 to 30 percent. The mean annual precipitation is about 10 inches and the mean annual temperature is about 46 degrees F.

**Taxonomic class:** Clayey, montmorillonitic, mesic, shallow Xerollic Durargids

**Typical pedon:** Buffaran very fine sandy loam, 0 to 4 percent slopes, is located in an area of map unit 2505. (Colors are for dry soil unless otherwise noted.)

A1--0 to 2 inches; pale brown (10YR 6/3) very fine sandy loam, dark brown (10YR 3/3) moist; moderate medium platy structure; slightly hard, very friable, nonsticky and slightly plastic; many fine and

common very fine roots; many fine and medium vesicular pores; 5 percent pebbles; mildly alkaline (pH 7.4); clear smooth boundary. (1 to 5 inches thick)

A2--2 to 5 inches; pale brown (10YR 6/3) very fine sandy loam; dark brown (10YR 3/3) moist; weak medium and thin platy structure; soft, very friable, nonsticky and nonplastic; few medium, common fine and very fine roots; common fine vesicular and irregular pores; moderately alkaline (pH 8.0); clear wavy boundary. (0 to 4 inches thick)

Bt1--5 to 9 inches; yellowish brown (10YR 5/4) clay loam, dark yellowish brown (10YR 4/4) moist; weak fine subangular blocky structure; hard, friable, sticky and plastic; common medium and fine roots; few medium tubular and common irregular pores; few thin clay films on faces of peds and lining pores; 10 percent pebbles; moderately alkaline (pH 8.2); gradual wavy boundary. (0 to 4 inches thick)

Bt2--9 to 18 inches; yellowish brown (10YR 5/4) clay, yellowish brown (10YR 5/4) moist; moderate medium subangular blocky structure; very hard, very firm, very sticky and very plastic; few medium and fine roots; common medium tubular and few fine irregular pores; common moderately thick clay films on faces of peds and lining pores; 5 percent pebbles; moderately alkaline (pH 8.2); clear smooth boundary. (3 to 14 inches thick)

Bqkm1--18 to 25 inches; indurated duripan, 2 millimeter thick silica laminar cap; massive; very hard, very firm; few fine roots; strongly effervescent; lime is in soft masses and coating pebbles; moderately alkaline (pH 8.4); gradual wavy boundary. (6 to 15 inches thick)

Bqkm2--25 to 60 inches; very pale brown (10YR 7/3) alternating layers of indurated and strongly cemented duripan; light yellowish brown (10YR 6/4) moist; massive; extremely hard; few fine roots; violently effervescent; strongly alkaline (pH 9.0)

**Type location:** Elko County, Nevada; in an unsectionized area, about 2 miles southeast of Desert Ranch Reservoir; 41 degrees, 40 minutes, 04 seconds north latitude, 116 degrees, 30 minutes, 27 seconds west longitude.

#### Range in Characteristics

**Soil moisture:** Usually dry; moist in winter and spring, dry early June through October

**Soil temperature:** 47 to 52 degrees F.

**Depth to duripan:** 14 to 20 inches.

#### A horizons:

Hue--10YR or 7.5YR

Value--5 or 6 dry, 3 or 4 moist, (after mixing upper 7 inches value is greater than 5.5 dry).

Chroma--2 or 3.

Reaction--Neutral to moderately alkaline.

#### Bt horizons:

Hue--10YR or 7.5YR.

Value--5 or 6 dry, 3 through 5 moist.

Chroma--2 through 6.

Texture--Clay or clay loam (35 to 50 percent clay).

Rock fragments--5 to 30 percent, mostly pebbles.

Reaction--Neutral through moderately alkaline.

#### Bq horizons: (when present):

Texture--Loam or clay loam.

Rock fragments--20 to 40 percent strongly cemented duripan fragments.

Reaction--Neutral through moderately alkaline, noneffervescent to strongly effervescent.

### Bulake Series

The Bulake series consists of shallow, well drained soils that formed in residuum from basalt and rhyolite. Bulake soils are on plateaus and hills. Slopes are 2 to 8 percent. Mean annual precipitation is about 14 inches and mean annual temperature is about 44 degrees F.

**Taxonomic class:** Clayey, montmorillonitic, frigid Lithic Mollic Haploxeralfs

**Typical pedon:** Bulake gravelly loam, 2 to 8 percent slopes, located in an area of map unit 2310. (Colors are for dry soil unless otherwise noted.) The soil surface is covered with 20 percent pebbles, 20 percent cobbles and a few stones.

A1--0 to 2 inches; pale brown (10YR 6/3) gravelly loam, dark brown (10YR 3/3) moist; weak thin platy structure; slightly hard, very friable, nonsticky and nonplastic; common fine and very fine roots; common medium and fine tubular pores; 15 percent pebbles, 5 percent cobbles; neutral (pH 6.8); clear smooth boundary. (2 to 4 inches thick)

A2--2 to 7 inches; pale brown (10YR 6/3) gravelly loam, dark brown (10YR 3/3) moist; weak fine granular structure; slightly hard, friable, slightly sticky and slightly plastic; many fine and very fine roots; few fine tubular pores; 15 percent pebbles; neutral (pH 6.8); abrupt wavy boundary. (3 to 6 inches thick)

Bt1--7 to 13 inches; yellowish brown (10R 5/4) clay, dark yellowish brown (10YR 4/4) moist; moderate fine and medium subangular blocky structure; hard, firm, sticky and plastic; few fine and very fine roots; few fine and very fine tubular pores; 5 percent pebbles, 5 percent cobbles; common moderately thick clay films on faces of peds and lining pores; neutral (pH 6.8); abrupt wavy boundary. (5 to 9 inches thick)

Bt2--13 to 19 inches; yellowish brown (10YR 5/4) clay, dark yellowish brown (10YR 4/4) moist; moderate medium and coarse prismatic structure parting to strong medium subangular blocky; very



hard, very firm, very sticky and very plastic; few very fine roots; few fine and very fine tubular pores; 5 percent pebbles; many thick clay films on faces of peds; neutral (pH 7.0); abrupt wavy boundary. (0 to 6 inches thick)

R--19 inches; rhyolite.

**Type location:** Elko County, Nevada; Owyhee Desert, about 3.5 miles east and .5 mile south of the Josephine Reservoir Dam; 41 degrees, 53 minutes, 40 seconds north latitude, 116 degrees, 23 minutes, 15 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Usually dry; moist in winter and spring, dry late July through October

*Soil temperature:* 44 to 47 degrees F.

*Depth to bedrock:* 14 to 20 inches.

*Thickness of solum:* 14 to 20 inches.

*Control section:*

Clay content--40 to 50 percent.

Rock fragments--5 to 35 percent, mainly pebbles.

**A horizons:**

Chroma--2 or 3.

Structure--Thin to thick platy or is granular.

**Bt horizons:**

Value--5 or 6 dry, 3 or 4 moist.

Chroma--3 through 6.

Texture--Clay or gravelly clay.

Structure--Moderate or strong, fine or medium, angular or subangular blocky; medium or coarse prismatic.

Reaction--Neutral or mildly alkaline.

## Bullump Series

The Bullump series consists of deep, well drained soils that formed in colluvium from welded tuff, quartzite, chert, argillite, shale, conglomerate and rhyolitic rocks with a component of loess. Bullump soils are on side slopes of hills and mountains. Slopes are 15 to 50 percent. Mean annual precipitation is about 15 inches, and the mean annual temperature is about 43 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, frigid Pachic Argixerolls

**Typical pedon:** Bullump very gravelly loam, 30 to 50 percent slopes, is located in an area of map unit 921. (Colors are for dry soils unless otherwise noted.)

A1--0 to 4 inches; dark grayish brown (10YR 4/2) very gravelly loam, very dark brown (10YR 2/2) moist; moderate medium subangular blocky structure

parting to moderate fine granular; slightly hard, very friable, slightly sticky and plastic; common very fine and fine, few medium roots; many very fine, few fine tubular and few fine interstitial pores; 35 percent pebbles; slightly acid (pH 6.1); clear smooth boundary. (2 to 8 inches thick)

A2--4 to 12 inches; dark grayish brown (10YR 4/2) very gravelly loam, very dark brown (10YR 2/2) moist; moderate medium subangular blocky structure; slightly hard, very friable, sticky and plastic; common very fine and fine, few medium roots; many very fine tubular pores; 45 percent pebbles; neutral (pH 6.8); clear wavy boundary. (3 to 12 inches thick)

Bt1--12 to 22 inches; brown (10YR 4/3) very gravelly clay loam, very dark brown (10YR 2/2) moist; moderate medium subangular blocky structure; hard, friable, sticky and plastic; many very fine and fine, common medium and few coarse roots; many very fine, few fine and medium tubular pores; many thick clay films bridging sand grains and lining pores, few thin on faces of peds; 45 percent pebbles, 10 percent cobbles; neutral (pH 6.8); clear broken boundary. (7 to 12 inches thick)

Bt2--22 to 32 inches; brown (10YR 5/3) very gravelly clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure; hard, very friable, sticky and plastic; many very fine, common fine, few fine and coarse roots; many very fine, common fine tubular pores; many thin clay films bridging sand grains and lining pores, common thin on faces of peds; 50 percent pebbles and 5 percent cobbles; neutral (pH 6.8); clear wavy boundary. (8 to 30 inches thick)

Bt3--32 to 41 inches; pale brown (10YR 6/3) very gravelly loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure parting to moderate fine subangular blocky; slightly hard, very friable, sticky and plastic; common very fine and fine, few medium roots; many very fine, common fine and medium and few coarse tubular pores; few thin clay films bridging sand grains and lining pores; 45 percent pebbles and 10 percent cobbles; neutral (pH 6.8); clear wavy boundary. (0 to 10 inches thick)

C--41 to 46 inches; light yellowish brown (10YR 6/4) very gravelly loam, dark yellowish brown (10YR 4/4) moist; massive; hard, very friable, slightly sticky and plastic; few very fine and fine roots; many very fine, common fine and few medium tubular pores; 50 percent pebbles and 5 percent cobbles; neutral (pH 6.6); abrupt wavy boundary. R--46 inches; welded tuff.

**Type location:** Elko County, Nevada; approximately .5 mile east and .25 mile south of Dry Creek Mountain; about 1,800 feet east and 600 feet south of the northwest corner of section 8, T. 40 N., R. 50 E.; 41 degrees, 21 minutes, 59 seconds north latitude,

116 degrees, 21 minutes, 12 seconds west longitude.

### Range in Characteristics

*Soil moisture:* Moist in winter and early summer, dry late July to early October. Additional soil moisture may be supplied by lateral water movement in the lower part of the profile

*Soil temperature:* 43 to 47 degrees F.

*Mollic epipedon thickness:* 20 to 40 inches and may include the upper part of the argillic horizon.

*Profile reaction:* Slightly acid through mildly alkaline.

*Other features:* Some pedons lack C horizons that are below 40 inches.

*Depth to bedrock:* 40 to 80 inches.

#### Control section:

Clay content--25 to 35 percent.

Rock fragments--35 to 55 percent, mainly pebbles with some cobbles.

#### A horizons:

Value--3 through 5 dry, 2 or 3 moist.

Chroma--1 through 3.

Other features--Organic matter 2 to 6 percent.

#### Bt horizons:

Hue--7.5YR or 10YR.

Value--4 through 6 dry, 2 through 4 moist.

Chroma--2 through 6.

Texture--Very gravelly loam or very gravelly clay loam.

Clay content--25 to 35 percent.

Rock fragments--35 to 55 percent, mainly pebbles.

Structure--Subangular blocky or angular blocky.

Consistence--Slightly sticky or sticky and slightly plastic or plastic, wet.

## Carstump Series

The Carstump series consists of moderately deep, well drained soils that formed in residuum from volcanic rocks. Carstump soils are on side slopes of mountains and hills. Slopes are 4 to 50 percent. The mean annual precipitation is about 11 inches and the mean annual temperature is about 44 degrees F.

**Taxonomic class:** Clayey-skeletal, montmorillonitic, frigid Aridic Calcic Argixerolls

**Typical pedon:** Carstump gravelly loam, 8 to 30 percent slopes, located in an area of map unit 1659. (Colors are for dry soil unless otherwise noted.)

A1--0 to 3 inches; brown (10YR 5/3) gravelly loam, very dark grayish brown (10YR 3/2) moist; weak medium platy structure; soft, friable, slightly sticky and plastic; common very fine roots; few fine tubular pores; 10 percent pebbles, 5 percent

cobbles; neutral (pH 7.0); clear smooth boundary. (3 to 7 inches thick)

A2--3 to 7 inches; brown (10YR 5/3) gravelly loam, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and plastic; few medium, fine and very fine roots; few fine tubular pores; 10 percent pebbles, 5 percent cobbles; neutral (pH 7.0); clear wavy boundary. (4 to 14 inches thick)

A3--7 to 14 inches; brown (10YR 5/3) cobbly loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; hard, firm, sticky and very plastic; few fine and very fine roots; few medium and fine tubular pores; 5 percent pebbles, 25 percent cobbles; neutral (pH 7.0); clear wavy boundary. (0 to 7 inches thick)

Bt1--14 to 22 inches; yellowish brown (10YR 5/4) very cobbly clay, yellowish brown (10YR 5/4) moist; strong medium angular blocky structure; extremely hard, extremely firm, very sticky and very plastic; few fine and very fine roots; many moderately thick stress surfaces on peds; 10 percent pebbles, 35 percent cobbles; mildly alkaline (pH 7.4); clear smooth boundary. (3 to 10 inches thick)

Btk--22 to 35 inches; yellowish brown (10YR 5/4) very cobbly clay, dark yellowish brown (10YR 4/4) moist; strong medium angular blocky structure; extremely hard, extremely firm, very sticky and very plastic; few fine and very fine roots; common moderately thick stress surfaces on peds; 10 percent pebbles, 35 percent cobbles; strongly effervescent; lime is in common soft masses; moderately alkaline (pH 8.2); clear wavy boundary. (5 to 18 inches thick)

Bk--35 to 36 inches; very pale brown (10YR 8/3) soft lime coatings on bedrock; violently effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary. (0 to 3 inches thick)

R--36 inches; consolidated rhyolite.

**Type location:** Elko County, Nevada; in an unsectionized area, about 3 miles southwest of Rodear Flat; 41 degrees, 25 minutes, 25 seconds north latitude, 116 degrees, 58 minutes, 23 seconds west longitude.

### Range in Characteristics

*Soil moisture:* Usually moist November to June; usually dry July through October

*Soil temperature:* 45 to 47 degrees.

*Mollic epipedon thickness:* 7 to 15 inches, includes the upper part of the argillic horizons in some pedons.

*Depth to secondary lime:* 20 to 35 inches.

*Depth to bedrock:* 20 to 40 inches.

#### Control section:

Clay content--40 to 55 percent.

Rock fragments--35 to 50 percent, mainly pebbles and cobbles.



**A horizons:**

Chroma--2 or 3.

**Bt and Btk horizons:**

Hue--10YR or 7.5YR.

Value--5 or 6 dry, 3 through 5 moist.

Chroma--3 or 4.

Structure--Angular blocky or subangular blocky.

Texture--Very gravelly clay, very cobbly clay.

Subhorizons of very gravelly silty clay loam or clay loam are in some pedons.

Consistence--Slightly hard to extremely hard, dry; friable to extremely firm moist; sticky or very sticky and plastic or very plastic; wet.

Reaction--Neutral or mildly alkaline in the noncalcareous upper part; moderately alkaline to strongly alkaline in the lower part.

Other features--Soft powdery lime in filaments or soft masses is in the Btk horizon. The Bt horizons are noneffervescent and the Btk horizons are slightly effervescent to violently effervescent.

## Cavanaugh Series

The Cavanaugh series consists of moderately deep, well drained soils that formed in colluvium from rhyolite. Cavanaugh soils are on side slopes of hills. Slopes are 15 to 50 percent. The mean annual precipitation is about 14 inches and the mean annual temperature is about 44 degrees F.

**Taxonomic class:** Clayey-skeletal, montmorillonitic, frigid Ultic Argixerolls

**Typical pedon:** Cavanaugh very stony loam, 15 to 50 percent slopes, located in an area of map unit 221. (Colors are for dry soils unless otherwise noted.) The soil surface is partially covered with approximately 5 percent stones, 5 percent cobbles and 20 percent pebbles.

A--0 to 5 inches; grayish brown (10YR 5/2) very stony loam, very dark grayish brown (10YR 3/2) moist; moderate coarse platy structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine roots; many very fine and fine tubular pores; 20 percent pebbles, 15 percent cobbles and 5 percent stones; neutral (pH 7.2); abrupt wavy boundary. (2 to 11 inches thick)

Bt1--5 to 9 inches; grayish brown (10YR 5/2) cobbly clay loam; very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure; hard, friable, sticky and plastic; common very fine and fine roots; few very fine and fine tubular pores; common moderately thick clay films bridging sand grains; 10 percent pebbles, 20 percent cobbles; neutral (pH 7.0); abrupt wavy boundary. (2 to 11 inches thick)

Bt1--9 to 21 inches; yellowish brown (10YR 5/4) very cobbly clay, dark grayish brown (10YR 3/4) moist; massive; hard, very firm, very sticky and very plastic; common very fine and fine roots; few very fine and fine tubular pores; common moderately thick clay films bridging sand grains; 30 percent pebbles, 25 percent cobbles; neutral (7.0); abrupt wavy boundary. (8 to 15 inches thick)

R--21 inches; fractured rhyolite.

**Type location:** Elko County, Nevada; approximately 13 miles southwest of Owyhee; about 3,000 feet north and 1,000 feet west of the southeast corner of section 34, T. 46 N., R. 51 E.; 41 degrees, 50 minutes, 19 seconds north latitude, 116 degrees, 14 minutes, 17 seconds west longitude.

### Range in Characteristics

*Soil moisture:* Usually moist; dry late July through mid October

*Soil temperature:* 42 to 47 degrees F.

*Thickness of solum and depth to bedrock:* 20 to 40 inches.

#### Control section:

Clay content--35 to 50.

Rock fragments--35 to 65 percent.

Base saturation by sum of cations--50 to 75 percent. (In part or all of the upper 75 cm)

**A horizon:**

Chroma--2 or 3, moist or dry.

Reaction--Slightly acid or neutral.

**Bt horizons:**

Hue--10YR or 7.5YR.

Value--5 or 6 dry, 4 or 5 moist.

Chroma--2 through 4.

Texture--Cobbly clay loam or cobbly clay in the upper subhorizons and very cobbly clay loam, very cobbly clay or very gravelly clay loam in the lower subhorizons.

Reaction--Slightly acid through mildly alkaline.

Structure--Granular, subangular blocky or is massive.

## Chen Series

The Chen series consists of shallow, well drained soils that formed in residuum and colluvium weathered from volcanic rocks and other sedimentary rocks. Chen soils are on hills and mountains. Slopes are 4 to 50 percent. The mean annual precipitation is about 12 inches and the mean annual temperature is about 44 degrees F.

**Taxonomic class:** Clayey-skeletal, montmorillonitic, frigid Lithic Argixerolls

**Typical pedon:** Chen very cobbly loam, 4 to 15 percent slopes, located in an area of map unit 1628. (Colors are for dry soil unless otherwise noted.) The soil surface is covered with 20 percent pebbles and 20 percent cobbles.

A1--0 to 2 inches; grayish brown (10YR 5/2) very cobbly loam, very dark grayish brown (10YR 3/2) moist; moderate medium platy structure; soft, friable, slightly sticky and plastic; common very fine roots; few medium and fine tubular pores; 2 percent stones, 15 percent cobbles, 20 percent pebbles; neutral (pH 7.2); clear smooth boundary. (1 to 6 inches thick)

A2--2 to 7 inches; grayish brown (10YR 5/2) very gravelly loam, dark brown (10YR 3/3) moist; moderate fine granular structure; slightly hard, friable, slightly sticky and plastic; few medium fine and very fine roots; few fine tubular pores; 10 percent cobbles, 25 percent pebbles; neutral (pH 7.2); abrupt smooth boundary. (2 to 8 inches thick)

Bt--7 to 15 inches; brown (10YR 5/3) very cobbly clay, dark yellowish brown (10YR 4/4) moist; strong medium angular blocky structure; very hard, very firm, very sticky and very plastic; few very fine roots; many moderately thick clay films on faces of peds; 35 percent cobbles, 10 percent pebbles; neutral (pH 7.2); clear smooth boundary. (6 to 12 inches thick)

R--15 inches; unweathered rhyolite.

**Type location:** Elko County, Nevada; in an unsectionized area, about 6 miles south of Rodear Flat; 41 degrees, 22 minutes, 25 seconds north latitude, 116 degrees, 56 minutes, 57 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Usually dry; moist in winter and spring, dry summer and fall

*Soil temperature:* 43 to 47 degrees.

*Mollic epipedon thickness:* 7 to 17 inches

*Depth to bedrock:* 12 to 20 inches.

*Reaction:* Slightly acid through mildly alkaline throughout.

#### A horizons:

Value--4 through 6 dry (less than 5.5 when the upper 7 inches are mixed), 2 or 3 moist.

Chroma--2 or 3.

#### Bt horizon:

Hue--7.5YR or 10YR with 5YR common in areas with high iron concentrations in the parent material.

Value--4 or 5 dry, 3 or 4 moist.

Chroma--2 through 4.

Texture--Very gravelly clay, extremely gravelly clay, very cobbly clay, extremely cobbly clay; some

pedons have thin Bt1 horizon of very gravelly clay loam with 35 to 40 percent clay.

Clay content--Average 40 to 55 percent.

Rock fragments--40 to 65 percent pebbles and cobbles normally increasing with depth.

Structure--Weak to strong, fine or medium angular or subangular blocky or platy.

## Cherry Spring Series

The Cherry Spring series consists of well drained soils that are moderately deep to a strongly cemented duripan. These soils formed in loess with large amounts of volcanic ash over mixed alluvium from sedimentary and pyroclastic material. The Cherry Spring soils are on fan piedmonts. Slopes are 2 to 8 percent. The mean annual precipitation is about 8 inches and the mean annual temperature is about 46 degrees F.

**Taxonomic class:** Fine-loamy, mixed, mesic Haploxerollic Durargids

**Typical pedon:** Cherry Spring gravelly loam, 2 to 8 percent slopes, is located in an area of map unit 1191. (Colors are for dry soil unless otherwise noted.) The soil surface is covered with 35 percent pebbles.

A1--0 to 3 inches; light brownish gray (10YR 6/2) gravelly loam, very dark grayish brown (10YR 3/2) moist; moderately thick platy structure parting to moderate very thin platy; soft, very friable, slightly sticky and slightly plastic; many very fine, common fine roots; many very fine and fine tubular pores; 15 percent pebbles; mildly alkaline (pH 7.6); clear smooth boundary. (2 to 8 inches thick)

A2--3 to 8 inches; pale brown (10YR 6/3) gravelly loam, dark brown (10YR 3/3) moist; moderate thin platy structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; many very fine tubular pores; 15 percent pebbles; mildly alkaline (pH 7.6); clear smooth boundary. (0 to 6 inches thick)

Bt--8 to 13 inches; pale brown (10YR 6/3) clay loam, brown (10YR 4/3) moist; weak coarse prismatic structure parting to moderate fine and medium subangular blocky; slightly hard, friable, sticky and plastic; common very fine, few fine and medium roots; many very fine tubular pores; common thin clay films on faces of peds and lining pores; 10 percent pebbles; mildly alkaline (pH 7.8); clear smooth boundary. (4 to 15 inches thick)

Btqk--13 to 23 inches; pale brown (10YR 6/3) clay loam, dark yellowish brown (10YR 4/4) moist; moderate fine and medium subangular blocky structure; slightly hard, friable, sticky and plastic; common very fine and fine roots; common very fine tubular pores; few thin clay films on faces of peds



and lining pores; 20 percent weak durinodes; few fine soft lime masses; 10 percent pebbles; moderately alkaline (pH 8.2); abrupt wavy boundary. (5 to 10 inches thick)

2Bqkm--23 to 45 inches; white (10YR 8/2) strongly silica and lime cemented duripan, very pale brown (10YR 7/3) moist; massive; very hard, very firm; violently effervescent; strongly alkaline (pH 8.6).

**Type location:** Elko County, Nevada; in an unsectionized area, about 6 miles southwest of Winters Ranch; 41 degrees, 26 minutes, 5 seconds north latitude, 116 degrees, 38 minutes, 26 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Usually dry; moist in the winter and spring, dry early June through October

*Soil temperature:* 47 to 51 degrees.

*Combined thickness of A and Bt horizons:* 20 to 40 inches.

*Depth to strongly cemented duripan:* 20 to 40 inches.

*Other features:* Substrata of contrasting textures are present below the duripan in some pedons.

*Control section:*

Clay--20 to 35 percent.

Rock fragments--0 to 15 percent.

#### A horizons:

Value--4 through 7 dry (greater than 5.5 when the upper 7 inches are mixed), 2 through 4 moist.

Chroma--2 or 3.

Reaction--Neutral or mildly alkaline.

#### Bt horizon:

Hue--10YR or 7.5YR.

Chroma--3 through 6.

Texture--Loam, silt loam, clay loam, with less than 35 percent sand.

Structure--Weak or moderate, fine to coarse prismatic and parts to subangular blocky.

Reaction--Mildly alkaline through strongly alkaline, increasing with depth.

#### Btqk horizon:

Hue--10YR or 7.5YR.

Structure--Subangular blocky or it is massive.

Reaction--Mildly alkaline to strongly alkaline.

Cementation--Weakly silica cemented or has 20 to 40 percent durinodes in a friable matrix.

Carbonates--Few to many lime filaments or soft masses. Slightly to violently effervescent.

#### Bqkm horizon:

Reaction--Moderately alkaline through very strongly alkaline.

Other features--Thin, discontinuous silica laminae common in some pedons.

## Chiara Series

The Chiara series consists of shallow to duripan, well drained soils that formed in alluvium from mixed rock sources with a loess mantle high in volcanic ash. The Chiara soils are on fan piedmont remnants and plateaus. Slopes are 0 to 15 percent. The mean annual precipitation is about 9 inches and the mean annual temperature is about 47 degrees F.

**Taxonomic class:** Loamy, mixed, mesic, shallow Xerollic Durorthids

**Typical pedon:** Chiara silt loam, 2 to 8 percent slopes located in an area of map unit 1229. (Colors are for dry soil unless otherwise noted.)

A1--0 to 3 inches; pale brown (10YR 6/3) silt loam, dark brown (10YR 3/3) moist; moderate medium platy structure; slightly hard, very friable, sticky and slightly plastic; many very fine and fine, few medium roots; many very fine tubular pores; mildly alkaline (pH 7.6); clear wavy boundary. (3 to 6 inches thick)

A2--3 to 6 inches; pale brown (10YR 6/3) silt loam, dark brown (10YR 3/3) moist; weak medium platy structure; slightly hard, very friable, sticky and slightly plastic; many very fine through coarse roots; common very fine tubular pores; mildly alkaline (pH 7.6); clear wavy boundary. (0 to 4 inches thick)

Bw--6 to 13 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, sticky and slightly plastic; many very fine and fine, common medium and coarse roots; common very fine tubular pores; mildly alkaline (pH 7.6); clear wavy boundary. (4 to 7 inches thick)

Bqk--13 to 17 inches; very pale brown (10YR 7/3) silt loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; hard, friable, sticky and slightly plastic; many very fine and fine, few medium roots; many very fine and few fine tubular pores; 20 percent .3 to 1 inch in diameter weakly cemented and brittle durinodes; violently effervescent, lime is disseminated; moderately alkaline (pH 8.4); abrupt wavy boundary. (4 to 10 inches thick)

Bqkm--17 to 40 inches; white (10YR 8/2) indurated duripan, very pale brown (10YR 7/3) moist with 1 to 2 inch continuous bands of fine sandy loam containing 35 percent brittle durinodes between 3 inch thick laminar plates; violently effervescent. (20 to 50 inches thick)

**Type location:** Elko County, Nevada; in an unsectionized area, about 2 miles north of the IL Ranch; 41 degrees, 36 minutes, 38 seconds north latitude, 116 degrees, 22 minutes, 18 seconds west longitude.

**Range in Characteristics**

*Soil moisture:* Usually dry; moist in winter and spring, dry from summer and fall

*Soil temperature:* 47 to 53 degrees F.

*Depth to duripan:* 10 to 20 inches.

*Other features:* Depth to lime--7 to 15 inches.

**Control section:**

Clay content--5 to 18 percent.

Rock fragments--When mixed, up to 5 percent, mainly pebbles, thin subhorizons in some pedons have 4 to 25 percent, comprised mainly of duripan fragments.

Sand--Less than 15 percent fine sand and coarser.

**A horizons:**

Value--3 or 4 moist.

Chroma--2 or 3.

Reaction--Neutral through moderately alkaline.

**Bw horizon:**

Value--6 or 7 dry, 3 through 5 moist.

Chroma--3 or 4.

Texture--Very fine sandy loam, loam, and silt loam.

Structure--Weak to strong, fine to coarse subangular blocky or weak prismatic.

Consistence--Soft or slightly hard, dry; very friable or friable moist; nonsticky to sticky and nonplastic or slightly plastic, wet.

Reaction--Neutral through strongly alkaline.

**Bqk horizon:**

Reaction--Moderately alkaline to strongly alkaline.

Value--6 or 7 dry, 4 or 5 moist.

Chroma--2 through 4.

Texture--Very fine sandy loam, loam or silt loam with 70 to 85 percent silt plus very fine sand.

Structure--Subangular blocky or is massive.

Consistence--Slightly hard or hard dry; very friable or friable, moist; slightly sticky or nonsticky wet.

Cementation--Contains from 20 to 60 percent weakly cemented and brittle durinodes from 0.3 to 1 inch in diameter.

**Bqkm horizon:**

Value--6 through 8 dry, 5 through 7 moist.

Chroma--2 through 4.

Structure--Massive or weak or moderate thick platy.

**Chime Series**

The Chime series are moderately deep, well drained soils that formed in residuum from tuffaceous sandstone. Chime soils are on side slopes of fan piedmont remnants with a rock core. Slopes are 8 to 15 percent. The mean annual precipitation is about 9 inches and the mean annual temperature is about 47 degrees F.

**Taxonomic class:** Fine-loamy, mixed, mesic Durixerollic Haplargids

**Typical pedon:** Chime gravelly loam, 8 to 15 percent slopes, located in an area of map unit 2751. (Colors are for dry soil unless otherwise noted.) The soil surface is covered with about 25 percent pebbles.

A1--0 to 2 inches; light brownish gray (10YR 6/2) gravelly loam, brown (10YR 4/3) moist; moderate thin platy structure parting to moderate fine granular; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; common fine and very fine vesicular pores; 15 percent pebbles; mildly alkaline (pH 7.6); clear smooth boundary. (2 to 5 inches thick)

A2--2 to 6 inches; light brownish gray (10YR 6/2) loam, dark grayish brown (10YR 4/2) moist; weak thin platy structure parting to moderate fine granular; slightly hard, very friable, slightly sticky and slightly plastic; few medium, fine and very fine roots; few fine and very fine vesicular pores; 10 percent pebbles; mildly alkaline (pH 7.6); clear smooth boundary. (2 to 4 inches thick)

Bt1--6 to 9 inches; pale brown (10YR 6/3) gravelly clay loam, brown (10YR 4/3) moist; moderate fine subangular blocky structure; hard, firm, sticky and plastic; few fine and very fine roots; common fine tubular pores; common moderately thick clay films on faces of peds and lining pores; 15 percent pebbles; mildly alkaline (pH 7.8); abrupt wavy boundary. (3 to 5 inches thick)

Bt2--9 to 15 inches; light yellowish brown (10YR 6/4) clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium and coarse angular blocky structure; hard, firm, sticky and plastic; few medium, fine and very fine roots; common fine tubular pores; strong moderately thick clay films on faces of peds and lining pores; 10 percent pebbles; mildly alkaline (pH 7.8); clear wavy boundary. (5 to 7 inches thick)

Bq--15 to 22 inches; light yellowish brown (10YR 6/4) clay loam, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure; very hard, very firm, slightly sticky and slightly plastic; few fine and very fine roots; few fine tubular pores; weak continuous silica cementation; 5 percent pebbles; mildly alkaline (pH 7.8); abrupt wavy boundary. (6 to 10 inches thick)

Cr--22 inches; weathered tuffaceous sandstone.

**Type location:** Elko County, Nevada; Owyhee Desert, in an unsectionized area, about 1.75 miles west of McCleary well No 2; 41 degrees, 32 minutes, 22 seconds north latitude, 116 degrees, 53 minutes, 34 seconds west longitude.



### Range in Characteristics

*Soil moisture:* Usually dry; moist in winter and spring, dry mid June through October

*Soil temperature:* 47 to 52 degrees F

*Depth to paralithic contact:* 20 to 30 inches.

*Depth to Bq horizons:* 14 to 20 inches.

#### A horizons:

Hue--10YR or 2.5Y.

Value--6 or 7 dry, 3 or 4 moist.

Chroma--2 or 3.

#### Bt horizons:

Hue--10 YR or 2.5Y.

Value--5 through 7 dry.

Chroma--3 or 4.

Clay content--27 to 35 percent.

Rock fragments--Up to 20 percent, mainly pebbles.

Structure--Moderate or strong, fine to coarse angular or subangular blocky.

#### Bq horizon:

Hue--10YR to 2.5Y.

Value--6 through 8 dry, 4 or 5 moist.

Texture--Loam, gravelly loam, clay loam, gravelly clay loam.

Rock fragments--5 to 20 percent, mainly pebbles.

## Cleavage Series

The Cleavage series consists of shallow, well drained soils that formed in residuum or colluvium from rhyolite, welded tuff, chert, shale, quartzite, sandstone or conglomerate and other igneous or sedimentary rocks. Cleavage soils are on hills and mountains. Slopes are 4 to 75 percent. The mean annual precipitation is about 14 inches and the mean annual temperature is about 44 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, frigid Lithic Argixerolls

**Typical pedon:** Cleavage gravelly loam, 4 to 15 percent slopes, is located in an area of map unit 1711. (Colors are for dry soil unless otherwise noted). The soil surface is covered with 15 percent pebbles and 5 percent cobbles.

A1--0 to 1 inch; grayish brown (10YR 5/2) gravelly loam, very dark brown (10YR 2/2) moist; moderate very fine platy structure; soft, very friable, slightly sticky and slightly plastic; many very fine roots; common very fine and fine vesicular pores; 15 percent pebbles, 5 percent cobbles, mildly alkaline (pH 7.4); clear smooth boundary. (1 to 9 inches thick)

A2--1 to 4 inches; grayish brown (10YR 5/2) gravelly loam, very dark grayish brown (10YR 3/2) moist;

weak very fine platy structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine, few fine and medium roots; common very fine and few fine tubular pores; 10 percent pebbles, 5 percent cobbles; mildly alkaline (pH 7.6); clear smooth boundary. (0 to 8 inches thick)

BA--4 to 9 inches; brown (10YR 5/3) very cobbly loam, very dark grayish brown (10YR 3/2) moist; moderate fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and plastic; common very fine, few fine and medium roots; common very fine tubular pores; 5 percent pebbles, 30 percent cobbles, 5 percent stones; mildly alkaline (pH 7.6); clear smooth boundary. (0 to 6 inches thick)

Bt--9 to 18 inches; light yellowish brown (10YR 6/4) very cobbly clay loam, brown (10YR 4/3) moist; moderate fine and medium subangular blocky structure; hard, firm, sticky and plastic; common very fine, few fine and thin clay films on faces of peds and lining pores; 30 percent pebbles, 25 percent cobbles; mildly alkaline (pH 7.6); abrupt wavy boundary. (6 to 12 inches thick)

R--18 inches; rhyolite.

**Type location:** Elko County, Nevada; about 5 miles west of Midas; about 100 feet east and 2,700 feet south of the northwest corner of section 24, T. 39 N., R. 45 E.; 41 degrees, 14 minutes, 33 seconds north latitude, 116 degrees, 51 minutes, 12 seconds west longitude.

### Range in Characteristics

*Soil moisture:* Moist in winter and spring, dry from July through October for 70 to 120 consecutive days

*Soil temperature:* 44 to 47 degrees F. and ranges down to 39 degrees F. in parts of Idaho.

*Mollic epipedon thickness:* 7 to 10 inches, does not include Bt horizon.

*Depth to bedrock:* 14 to 20 inches.

*Reaction:* Neutral or mildly alkaline.

*Control section:*

Clay content--20 to 35 percent.

Rock fragments--50 to 80 percent, mostly pebbles or cobbles.

#### A horizons:

Value--4 or 5 dry, 2 or 3 moist.

Chroma--2 or 3

#### BA horizon:

Chroma--2 through 4.

Texture--Very cobbly loam or very gravelly loam.

Consistence--Slightly plastic or plastic, wet.

#### Bt horizon:

Hue--7.5YR or 10YR.

Value--5 or 6 dry, 3 or 4 moist.

Chroma--3 or 4.

Texture--Very cobbly, extremely cobbly, very gravelly or extremely gravelly clay loam, very gravelly sandy clay loam,  
 Structure--Subangular blocky or angular blocky or it is massive.  
 Consistence--Friable or firm, moist.

## Clementine Series

The Clementine series consists of very deep, poorly drained soils that formed in alluvium derived from mixed rock sources with influence from loess. The Clementine soils are on floodplains, stream terraces and inset fans. Slopes are 0 to 8 percent. The mean annual precipitation is about 9 inches and the mean annual temperature is about 50 degrees F.

**Taxonomic class:** Fine-silty, mixed, mesic Cumulic Haplaquolls

**Typical pedon:** Clementine silt loam, drained, 0 to 2 percent slopes, located in an area of map unit 1130. (Colors are for dry soil unless otherwise noted.)

A1--0 to 3 inches; grayish brown (10YR 5/2) silt loam, very dark grayish brown (10YR 3/2) moist; moderate medium platy structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and few fine roots; few very fine tubular and common very fine interstitial pores; neutral (pH 6.6); abrupt wavy boundary. (2 to 4 inches thick)

A2--3 to 12 inches; grayish brown (10YR 5/2) silty clay loam, very dark grayish brown (10YR 3/2) moist; moderate coarse subangular blocky structure; hard, friable, sticky and slightly plastic; many very fine and fine, few medium and coarse roots; common very fine tubular and interstitial pores; mildly alkaline (pH 7.6); abrupt wavy boundary. (8 to 12 inches thick)

A3--12 to 20 inches; dark grayish brown (10YR 4/2) silty clay loam, black (10YR 2/1) moist; few fine distinct strong brown (7.5YR 4/6) iron mottles; moderate medium subangular blocky structure; hard, friable, sticky and plastic; many very fine, fine, medium and coarse roots; common very fine tubular and interstitial pores; mildly alkaline (pH 7.6); clear wavy boundary. (6 to 10 inches thick)

Bk--20 to 27 inches; grayish brown (10YR 5/2) silt loam, very dark grayish brown (10YR 3/2) moist; common fine distinct strong brown (7.5YR 4/6) iron mottles; few, fine manganese stains; moderate medium subangular blocky structure; slightly hard, friable, sticky and plastic; common very fine and fine, few medium and coarse roots; many very fine, few fine tubular pores; few fine soft lime masses; slightly effervescent matrix; moderately alkaline (pH 8.2); clear wavy boundary. (5 to 9 inches thick)

Bk1--27 to 33 inches; light brownish gray (2.5Y 6/2) silty clay loam, dark grayish brown (2.5Y 4/2)

moist; few, fine distinct, strong brown (7.5YR 4/6) iron mottles; few fine manganese stains on faces of peds; moderate medium subangular blocky structure; hard, friable, sticky and plastic; few very fine and fine roots; many very fine tubular pores; common fine soft lime masses; slightly effervescent; moderately alkaline (pH 8.4); clear wavy boundary. (5 to 8 inches thick)

Bk3--33 to 44 inches; light brownish gray (2.5Y 6/2) silty clay loam, dark grayish brown (2.5Y 4/2) moist; few, fine, distinct strong brown (7.5YR 4/6) iron mottles; weak medium subangular blocky structure; hard, friable, sticky and plastic; few very fine and fine roots; many very fine tubular pores; many fine soft lime masses; strongly effervescent; moderately alkaline (pH 8.4); clear wavy boundary. (8 to 12 inches thick)

Bk3--44 to 58 inches; light brownish gray (2.5Y 6/2) clay loam, dark grayish brown (2.5Y 4/2) moist; common fine distinct strong brown (7.5YR 4/6) iron mottles; weak medium subangular blocky structure; hard, friable, sticky and plastic; few very fine and fine roots; many very fine tubular pores; few fine lime filaments; noneffervescent matrix; moderately alkaline (pH 8.4); clear wavy boundary. (10 to 20 inches thick)

Bk4--58 to 60 inches; light gray (2.5Y 7.2) loam, grayish brown (2.5Y 5/2) moist; common fine distinct strong brown (7.5YR 4/6) iron mottles; few fine manganese stains; massive; slightly hard, friable, sticky and slightly plastic; few very fine roots; many very fine interstitial and few very fine tubular pores; slightly effervescent; moderately alkaline (pH 8.4)

**Type location:** Elko County, Nevada; approximately 8 miles northeast of Squaw Valley Ranch; about 900 feet west and 1,700 feet south of the northeast corner of section 11, T. 39 N., R. 47 E.; 41 degrees, 16 minutes, 29 seconds north latitude, 116 degrees, 37 minutes, 42 seconds west longitude.

### Range in Characteristics

**Soil moisture:** Saturated at or near the surface for one month or more during February through July.

Drained phases are recognized

**Soil temperature:** 47 to 53 degrees F.

**Mollic epipedon thickness:** 24 to 30 inches.

**Depth to carbonates:** 12 to 40 inches.

**Other features:** Few to common, fine, redox concentrations occur below depths of 12 inches.

**Control section:**

Clay content--25 to 35 percent.

### A horizons:

Value--4 or 5 dry, 2 or 3 moist.

Chroma--1 through 3 dry or moist.

Reaction--Neutral to strongly alkaline.



**Bk horizons:**

Hue--10YR or 2.5Y.

Value--5 through 7 dry, 3 through 5 moist.

Chroma--1 through 3 dry or moist.

Texture--Stratified silt loam or silty clay loam. Strata of loam or clay loam are below depths of 40 inches in some pedons.

Structure--Subangular blocky or is massive.

Consistence--Friable or firm, moist, slightly sticky or sticky, wet.

Reaction--Moderately alkaline or strongly alkaline.

Other features--Few fine manganese stains are on peds in most pedons.

**Clurde Series**

The Clurde series consists of very deep, well drained soils that formed in loess and volcanic ash over alluvium from mixed rock sources. Clurde soils are on alluvial fans, fan skirts, inset fans and dissected terraces. Slopes are 0 to 15 percent. The mean annual precipitation is about 8 inches and the mean annual temperature is about 45 degrees F.

**Taxonomic class:** Fine-loamy, mixed, mesic Durixerollic Camborthids

**Typical pedon:** Clurde very fine sandy loam, 0 to 2 percent slopes, located in an area of map unit I155. (Colors are for dry soil unless otherwise noted.)

A1--0 to 3 inches; pale brown (10YR 6/3) very fine sandy loam, dark brown (10YR 3/3) moist; weak thick platy structure; soft, very friable, slightly sticky and slightly plastic; few very fine roots; many fine vesicular pores; 5 percent pebbles; neutral (pH 7.2); abrupt smooth boundary. (2 to 8 inches thick)

A2--3 to 6 inches; pale brown (10YR 6/3) very fine sandy loam, brown (10YR 4/3) moist; moderate thin platy structure; slightly hard, friable, slightly sticky and slightly plastic; few fine and very fine roots; few very fine tubular pores; mildly alkaline (pH 7.4); clear smooth boundary. (0 to 4 inches thick)

BA--6 to 10 inches; pale brown (10R 6/3) loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and plastic; few fine and very fine roots; few very fine tubular pores; moderately alkaline (pH 8.0); clear smooth boundary. (2 to 8 inches thick)

Bw--10 to 20 inches; light yellowish brown (10YR 6/4) loam, dark yellowish brown (10YR 4/4) moist, weak coarse subangular blocky structure; hard, friable, slightly sticky and plastic; few thin clay films lining pores; 5 percent pebbles; moderately alkaline (pH 8.0); clear smooth boundary. (4 to 10 inches thick)

Bqk1--20 to 29 inches; very pale brown (10YR 7/3) loam, dark yellowish brown (10YR 4/4) moist; massive; very hard, friable, sticky and plastic; 20

percent durinodes; lime is in common fine threads and filaments; strongly effervescent; moderately alkaline (pH 8.2); gradual wavy boundary. (7 to 13 inches thick)

2Bqk2--29 to 43 inches; very pale brown (10YR 7/3) coarse sandy loam, brown (10YR 4/3) moist; massive; very hard, friable, slightly sticky and slightly plastic; 10 percent pebbles; 15 percent durinodes; lime is in common fine soft masses; strongly effervescent; moderately alkaline (pH 8.2); gradual wavy boundary. (12 to 14 inches thick)

2Bqk3--43 to 60 inches; pale brown (10YR 6/3) loamy sand, brown (10YR 4/3) moist; massive; hard, very friable, nonsticky and nonplastic; weakly cemented with silica and lime; 20 percent durinodes; 10 percent pebbles; lime is in common fine soft masses; strongly effervescent; moderately alkaline (pH 8.4).

**Type location:** Elko County, Nevada; in an unsectionized area, about 1 1/8 miles south and 7/8 mile west of McCleary Well No. 1; 41 degrees, 35 minutes, 45 seconds north latitude, 116 degrees, 52 minutes, 01 seconds west longitude.

**Range in Characteristics**

*Soil moisture:* Usually dry; moist for short periods, December through March

*Soil temperature:* 47 to 52 degrees F.

*Depth to base of Bw horizon:* 12 to 20 inches.

*Depth to carbonates:* 12 to 24 inches.

*Control section:*

Clay content--18 to 30 percent.

**A horizons:**

Value--5 through 7 dry, 3 or 4 moist; when mixed values are greater than 5 dry and 3 moist.

Chroma--2 or 3.

Reaction--Neutral or mildly alkaline.

Other features--Pedons with transitional BA horizons are common.

**Bw horizon:**

Texture--Clay loam, loam, silt loam.

Clay content--18 to 30 percent

Rock fragments--0 to 15 percent, mainly pebbles.

Structure--Weak or moderate subangular blocky.

Consistence--Slightly hard or hard, dry; friable or very friable, moist; slightly sticky or sticky and slightly plastic or plastic, wet.

Reaction--Moderately alkaline or strongly alkaline.

**Bq and Bqk horizons:**

Value--5 through 7 dry, 4 through 6 moist.

Chroma--2 or 4.

Texture--Stratified gravelly sandy loam to clay loam. Some pedons have horizons with texture of loamy sand below 40 inches.

Clay content--15 to 25 percent.

Rock fragments--5 to 30 percent, mainly pebbles.  
 Structure--Weak or medium subangular blocky or platy or is massive.  
 Consistence--Very friable to firm, moist; nonsticky to sticky and nonplastic to plastic, wet  
 Reaction--Moderately alkaline through very strongly alkaline.  
 Effervescence (Bqk horizons)--Slightly effervescent through violently effervescent.  
 Cementation--20 to 60 percent durinodes. Thin layers with continuous brittle matrix are in some pedons.  
 Other features--Thin Bq horizons are above Bqk horizons in some pedons.

## Clurde Variant

The Clurde variant consists of moderately deep, well drained soils that formed in mixed alluvium. Clurde variant soils are on inset fans. Slopes are 0 to 2 percent. The mean annual precipitation is about 9 inches and the mean annual temperature is about 47 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic  
 Durixerollic Camborthids

**Typical pedon:** Clurde variant loam, 0 to 2 percent slopes, located in an area of map unit 2531. (Colors are for dry soil unless otherwise noted.)

A1--0 to 3 inches; pale brown (10YR 6/3) loam, dark brown (10YR 3/3) moist; moderate medium platy structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; common fine vesicular pores; 5 percent pebbles; neutral (pH 7.2); abrupt smooth boundary. (2 to 3 inches thick)

A2--3 to 7 inches; pale brown (10YR 6/3) loam, dark brown (10YR 3/3) moist; weak medium platy structure; slightly hard, friable, slightly sticky and plastic; few very fine roots; few fine tubular pores; 10 percent pebbles; neutral (pH 7.2); clear smooth boundary. (3 to 7 inches thick)

Bw--7 to 13 inches; pale brown (10YR 6/3) loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, firm, sticky and plastic; few medium, fine and very fine roots; few fine tubular pores; 15 percent pebbles; neutral (pH 7.2); gradual wavy boundary. (6 to 7 inches thick)

Bq1--13 to 19 inches; light yellowish brown (10YR 6/4) gravelly sandy clay loam, yellowish brown (10YR 5/4) moist; moderate medium subangular blocky structure; hard, firm, and brittle, sticky and plastic; 25 percent pebbles; continuous brittle matrix; neutral (pH 7.2); clear wavy boundary. (6 to 7 inches thick)

Bq2--19 to 30 inches; light yellowish brown (10YR 6/4) very gravelly sandy loam, yellowish brown

(10YR 5/4) moist; massive; hard, firm, and brittle, nonsticky and nonplastic; 55 percent pebbles; continuous brittle matrix; neutral (pH 7.2); clear wavy boundary. (5 to 11 inches thick)  
 Bq3--30 to 32 inches; lightly yellowish brown (10YR 6/4) gravelly clay, yellowish brown (10YR 5/4) moist; massive; very hard, very firm, very sticky and very plastic; 20 percent pebbles; weak continuous silica cementation; mildly alkaline (pH 7.4); abrupt wavy boundary. (0 to 2 inches thick)  
 R--32 inches; consolidated basalt.

**Type location:** Elko County, Nevada; in an unsectionized area, about 1.5 miles south of Silver Lake; 41 degrees, 38 minutes, 28 seconds north latitude, 116 degrees, 39 minutes, 19 seconds west longitude.

### Range in Characteristics

*Soil moisture:* Moist in winter and spring, dry June through October

*Soil temperature:* 47 to 51 degrees F.

*Depth to continuous brittle matrix:* 12 to 17 inches.

*Depth to bedrock:* 24 to 32 inches.

*Control section:*

Coarse fragments: 35 to 50 average.

### Bw horizon:

Chroma--3 or 4.

Clay content--20 to 25 percent.

Rock fragments--15 to 35 percent, mostly pebbles.

### Bq horizons:

Value--4 or 5 moist.

Chroma--3 or 4.

Rock fragments--20 to 60 percent.

## Coltroop Series

The Coltroop series consists of shallow, well drained soils that formed in a thin loess mantle over alluvium from rhyolite and basalt. The Coltroop soils are the plateaus and fan piedmont remnants. Slopes are 0 to 4 percent. The mean annual precipitation is about 9 inches and the mean annual temperature is about 47 degrees F.

**Taxonomic class:** Loamy, mixed, mesic, shallow  
 Xerollic Durorthids

**Typical pedon:** Coltroop very fine sandy loam, 0 to 2 percent slopes located in an area of map unit 2205. (Colors are for dry soil unless otherwise noted.)

A1--0 to 2 inches; light brownish gray (6/2) very fine sandy loam, dark grayish brown (10YR 4/2) moist; weak medium platy structure; slightly hard, very friable, slightly sticky and slightly plastic; few fine



and very fine roots; common medium, many fine and very fine pores; 5 percent pebbles; mildly alkaline (pH 7.4); clear smooth boundary. (2 to 3 inches thick)

A2--2 to 5 inches; light brownish gray (10YR 6/2) silt loam, dark grayish brown (10YR 4/2) moist; weak thin platy structure parting to moderate fine granular; slightly hard, very friable, slightly sticky and slightly plastic; few medium, many fine and very fine roots; few fine tubular pores; 5 percent pebbles; mildly alkaline (pH 7.4); abrupt wavy boundary. (2 to 4 inches thick)

Bw--5 to 10 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; common medium, fine and very fine roots; few fine tubular pores; 5 percent pebbles; mildly alkaline (pH 7.6); abrupt wavy boundary. (5 to 11 inches thick)

Bqk--10 to 17 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; weak fine and medium subangular blocky structure; hard, firm, slightly sticky and slightly plastic; few medium pebbles; weakly cemented with silica and lime; 40 percent durinodes; slightly effervescent; mildly alkaline (pH 7.8); abrupt wavy boundary. (2 to 8 inches thick)

2Bqkm--17 to 27 inches; very pale brown (10YR 8/4) continuous indurated duripan; very pale brown (10YR 7/4) moist; strong thick platy structure; extremely hard, very firm; few very fine roots along plate surfaces; violently effervescent; abrupt wavy boundary. (9 to 10 inches thick)

2Ck--27 to 32 inches; very pale brown (10YR 7/4) sandy loam, yellowish brown (10YR 5/4) moist; massive; loose, nonsticky and nonplastic; common very fine roots; 10 percent pebbles; violently effervescent; lime is disseminated; moderately alkaline (pH 8.4); abrupt wavy boundary (0 to 5 inches thick)

R--32 inches; rhyolite.

**Type location:** Elko County, Nevada; in a unsectionized area, about 4.75 miles northeast of Lake Creek Reservoir, near the Little Owyhee River; 41 degrees, 59 minutes, 22 seconds north latitude, 116 degrees, 52 minutes, 12 seconds west longitude.

#### Range in Characteristics

**Soil moisture:** Moist in winter and spring, dry June through October

**Soil temperature:** 47 to 52 degrees F.

**Depth to duripan:** 14 to 20 inches.

**Depth to bedrock:** 30 to 35 inches.

**Depth to Bqk horizons:** 10 to 16 inches.

#### Control section:

Clay content--20 to 30 percent.

Rock fragments--0 to 15 percent.

#### A horizons:

Chroma--2 or 3.

#### Bw horizon:

Chroma--3 or 4.

Clay content--18 to 27 percent.

#### Bqk horizons:

Value--4 or 5 moist.

Chroma--3 or 4.

Texture--Silt loam or silty clay loam.

Clay content--20 to 30 percent.

Durinodes--20 to 40 percent.

Reaction--Mildly alkaline or moderately alkaline.

#### Bqkm horizon:

Structure--Thick platy or is massive.

### Cotant Series

The Cotant series consists of shallow, well-drained soils formed in residuum from tuff and mixed sedimentary rocks. Cotant soils are on hills. Slopes are 2 to 50 percent. The mean annual precipitation is about 14 inches and the mean annual temperature is about 44 degrees F.

**Taxonomic class:** Clayey, montmorillonitic, frigid, shallow Aridic Argixerolls

**Typical pedon:** Cotant cobbly loam, 4 to 15 percent slopes located in an area of map unit 308. (Colors are for dry soils unless otherwise noted.) The surface is covered by 5 percent pebbles, 15 percent cobbles and 5 percent stones.

A--0 to 3 inches; light brownish gray (10YR 6/2) cobbly loam, very dark grayish brown (10YR 3/2) moist; weak thick platy structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots; common very fine vesicular pores; 5 percent pebbles, 15 percent cobbles; neutral (7.0); clear wavy boundary. (2 to 5 inches thick)

Bt1--3 to 7 inches; brown (10YR 5/3) cobbly clay, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; soft, very friable, very sticky and very plastic; many very fine and fine, common medium, few coarse roots; common very fine tubular pores; few moderately thick clay films coating and bridging sand grains; many stress surfaces on faces of peds; 5 percent pebbles, 15 percent cobbles; neutral (pH 7.0); clear wavy boundary. (4 to 12 inches thick)

Bt2--7 to 20 inches; brown (10YR 5/3) clay, dark brown (10YR 4/3) moist; strong coarse prismatic

structure; very hard, very firm, very sticky and very plastic; few very fine and fine roots; common very fine tubular pores; continuous stress surfaces on faces of peds; 5 percent pebbles; mildly alkaline (pH 7.4); clear wavy boundary. ( 5 to 13 inches thick)  
 Cr1--20 to 24 inches; pale brown (10YR 6/3) weathered tuff bedrock with common moderately thick clay films coating fracture planes; few very fine roots in fractures. (4 to 12 inches thick)  
 Cr2--24 inches; very pale brown weathered tuff bedrock with few thin clay films coating fracture planes; few very fine roots in fractures.

**Type location:** Elko County, Nevada; approximately 3.5 miles south of Willow Creek Reservoir; about 1,200 feet north and 1,700 feet west of the southeast corner of section 16, T. 38 N., R 48 E.; 41 degrees, 09 minutes, 56 seconds north latitude, 116 degrees, 33 minutes, 05 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Usually moist; moist in winter and spring, dry July through October

*Soil temperature:* 42 to 47 degrees F.

*Mollic epipedon thickness:* 7 to 14 inches, including upper part of argillic horizons.

*Solum thickness and depth to paralithic contact:* 12 to 20 inches.

*Profile reaction:* Neutral or mildly alkaline.

#### A horizon:

Value--5 or 6 dry, 5.5 or darker when upper 7 inches are mixed.

Chroma--2 or 3.

#### Bt horizons:

Value--4 through 6 dry, 3 through 5 moist. The upper subhorizons is 4 or 5 dry and 3 moist.

Chroma--2 through 4, with 4 only in the lower subhorizons.

Texture--Dominantly clay, cobbly clay, gravelly clay or gravelly clay loam common in some subhorizons.

Clay content--40 to 60 percent.

Rock fragments--0 to 15 percent, mainly pebbles and cobbles; up to 25 percent common in some subhorizons.

Structure--Prismatic, angular blocky or subangular blocky.

Other features--Darker crushed matrix values common in upper part of horizons.

Consistence--Soft to very hard, dry; very friable to very firm, moist; sticky or very sticky and plastic or very plastic, wet.

#### Cr horizons:

Clay films--Some pedons lack clay films.

## Creemon Series

The Creemon series consists of very deep, well drained soils that formed in silty alluvium from mixed rock sources with a component of volcanic ash and loess. Creemon soils are on stream terraces. Slopes are 0 to 2 percent. The mean annual precipitation is about 7 inches and the mean annual temperature is about 47 degrees F.

**Taxonomic class:** Coarse-silty, mixed, mesic Duric Camborthids

**Typical pedon:** Creemon silt loam, 0 to 2 percent slopes located in an area of map unit 1530. (Colors are for dry soil unless otherwise noted.)

A1--0 to 3 inches; light brownish gray (10YR 6/2) silt loam, dark grayish brown (10YR 4/2) moist; moderate very thick platy parting to moderate very fine platy structure; soft, very friable, slightly sticky and slightly plastic; common very fine, few fine roots; many very fine vesicular pores; 1 percent gravel; moderately alkaline (pH 8.0); clear smooth boundary. (3 to 7 inches thick)

A2--3 to 8 inches; light brownish gray (10YR 6/2) silt loam, dark grayish brown (10YR 4/2) moist; moderate very thin platy structure; soft, very friable, slightly sticky and slightly plastic; common very fine, few fine and medium roots; common very fine tubular pores; moderately alkaline (pH 8.0); clear smooth boundary. (0 to 8 inches thick)

Bw--8 to 14 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; moderate medium and thick platy structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine, few fine and medium roots; common very fine tubular pores; moderately alkaline (pH 8.0); clear smooth boundary. (4 to 8 inches thick)

Bq--14 to 25 inches; light yellowish brown (10YR 6/4) weakly stratified silt loam, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; common very fine, few fine and medium roots; few very fine and fine tubular pores; 10 percent durinodes; moderately alkaline (pH 8.4); clear smooth boundary. (0 to 12 inches thick)

Bqk--25 to 47 inches; light yellowish brown (10YR 6/4) silt loam, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; common very fine, few medium roots; few very fine tubular pores; 20 percent discontinuous weak silica cementation; 20 percent durinodes; few fine irregular lime filaments; strongly effervescent; moderately alkaline (pH 8.2); clear smooth boundary. (15 to 30 inches thick)

Ck--47 to 60 inches; light yellowish brown (10YR 6/4) stratified very fine sandy loam and fine sandy loam, dark yellowish brown (10YR 3/4) moist; massive; slightly hard, friable, slightly sticky and slightly



plastic; common very fine roots; common very fine tubular pores; common fine irregular lime filaments and seams; strongly effervescent; strongly alkaline (pH 8.5).

**Type location:** Elko County, Nevada; approximately 3 miles southeast of the Upper Clover Ranch; about 2,200 feet west and 2,000 feet north of the southeast corner of section 26, T. 38 N., R. 44 E.; 41 degrees, 08 minutes, 33 seconds north latitude, 116 degrees, 58 minutes, 45 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Usually dry; moist in some part for short periods from October through May

*Soil temperature:* 48 to 52 degrees F.

*Thickness of A and Bw horizons:* 11 to 15 inches.

*Control section:*

Clay content--8 to 18 percent.

Texture--Stratified silt loam to very fine sandy loam.

*Depth to Bq or Bqk horizons:* 11 to 20 inches.

*Reaction:* Moderately alkaline or strongly alkaline throughout.

*Other features:* Some pedons have lenses of volcanic ash in their lower profiles; some pedons have up to 20 percent pebbles at depths below 40 inches, and a continuous brittle matrix layer at depths between 40 to 55 inches, these soils are normally moderately or strongly salt and sodium affected below depths of 20 to 30 inches, but some pedons are moderately or strongly affected throughout.

#### A horizons:

Value--6 or 7 dry, 3 or 4 moist.

Chroma--2 or 3.

Other features--Noneffervescent or slightly effervescent.

#### Bw horizon:

Value--6 or 7 dry.

Chroma--2 through 4.

Structure--Thin to thick platy or it is weak medium subangular blocky.

Consistence--Soft or slightly hard, very friable or friable, moist; nonsticky or slightly sticky, nonplastic or slightly plastic.

#### Bq and Bqk horizons:

Value--5 through 7 dry, 4 or 5 moist.

Chroma--2 through 4.

Consistence--Soft or slightly hard, dry; very friable or friable moist; nonsticky or slightly sticky.

Other features--Strongly or violently effervescent in Bqk horizons; 20 to 40 percent durinodes; many pedons between depths of 11 to 29 inches have a 3 to 10 inch thick horizon with 20 to 60 percent discontinuous weakly silica cemented lenses.

## Crooked Creek Series

The Crooked Creek series consists of very deep, poorly drained soils that formed in alluvium from mixed sedimentary and igneous rocks. Crooked Creek soils are on axial stream flood-plains, stream terraces and localized seeps. Slopes are 0 to 4 percent. The mean annual precipitation is about 14 inches and the mean annual temperature is about 44 degrees F.

**Taxonomic class:** Fine, montmorillonitic, frigid Cumulic Haplaquolls

**Typical pedon:** Crooked Creek silty clay loam, 0 to 2 percent slopes in an area of map unit 184. (Colors are for dry soil unless otherwise noted.)

A1--0 to 3 inches; very dark gray (10YR 3/1) silty clay loam, black (10YR 2/1) moist; strong fine and medium subangular blocky structure; hard, friable, sticky and plastic; many very fine, fine and medium roots; many very fine interstitial pores; neutral (pH 7.2); abrupt smooth boundary. (1 to 3 inches thick)

A2--3 to 13 inches; very dark gray (10YR 3/1) silty clay, black (10YR 2/1) moist; few fine distinct brown (10YR 5/3) mottles; strong medium prismatic structure parting to strong fine angular blocky; very hard, firm, very sticky and very plastic; common very fine and fine roots; few very fine tubular pores; few clean sand grains on faces of peds; neutral (pH 7.0); clear smooth boundary. (3 to 10 inches thick)

A3--13 to 28 inches; very dark gray (10YR 3/1) silty clay, black (10YR 2/1) moist; common fine prominent yellowish red (5YR 4/6) and medium distinct brown (10 YR5/3) mottles and common manganese stains; strong medium prismatic structure parting to strong fine angular blocky; very hard, firm, very sticky and very plastic; common very fine and fine roots; common very fine tubular pores; common fine and medium clean sand grains within peds; neutral (pH 7.0); abrupt smooth boundary. (4 to 15 inches thick)

A4--28 to 37 inches; dark gray (10YR 4/1) silty clay, very dark gray (10YR 3/1) moist; common fine prominent strong brown (7.5YR 5/6) and many large distinct brown(10YR 5/3) mottles and common fine manganese stains; strong medium prismatic structure parting to strong fine angular blocky; very hard, firm, very sticky and very plastic; common very fine and fine roots; common very fine and fine tubular pores; few thin clay films lining pores; neutral (pH 7.0); abrupt smooth boundary. (3 to 14 inches thick)

C1--37 to 45 inches; dark grayish brown (10YR 4/2) silty clay loam, very dark grayish brown (10YR 3/2) moist; common fine prominent strong brown (7.5YR 5/6) and few fine prominent yellowish red (5YR 4/6) and many medium distinct brown (10YR 5/3) mottles and few fine manganese stains; massive; hard, friable, very sticky and plastic; few very fine

and fine roots; common very fine tubular pores; neutral (pH 7.0); abrupt smooth boundary. (0 to 14 inches thick)

C2--45 to 60 inches; dark grayish brown (10YR 4/2) silty clay loam, very dark grayish brown (10YR 3/2) moist; common fine and medium prominent strong brown (7.5YR 5/6) and few fine prominent yellowish red (5YR 4/6) and few large distinct black (10YR 2/1) and many medium distinct brown (10YR 5/3) mottles and common fine manganese stains; massive; very hard, firm, very sticky and very plastic; few very fine roots; few very fine tubular pores; common thin silt coating lining pores and bridging mineral grains; neutral (pH 7.2).

**Type location:** Elko County, Nevada; about 4 miles east of Deep Creek Reservoir; 2,500 feet west and 1,300 feet south of the northeast corner of section 34, T. 43 N., R. 51 E.; 41 degrees, 35 minutes, 07 seconds north latitude, 116 degrees, 13 minutes, 55 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* The soil is saturated at or near the surface for at least one month during most years

*Soil temperature:* 43 to 47 degrees F.

*Mollic epipedon thickness:* Greater than 24 inches.

*Profile reaction:* Neutral to moderately alkaline.

*Control section:*

Percent clay--Averages 35 to 50.

Texture--Mostly clay loam, silty clay loam, clay or silty clay with thin lenses of loam or silt loam.

Rock fragments--Averages 0 to 10 percent.

#### A horizons:

Value--3 through 5 dry, 1 through 3 moist.

Chroma--1 or 2.

Other features--Most subhorizons have faint to distinct mottles.

#### C horizons:

Hue--10YR, 7.5YR, 5Y or 2.5Y.

Value--3 through 6 dry, 3 through 5 moist.

Chroma--1 to 4.

Texture--Clay loam, silty clay loam, or silt loam.

Clay content--Averages 30 to 40 percent.

Rock fragments--Averages 0 to 10 percent. Some pedons may have up to 75 percent rock fragments in the subhorizons below 36 inches, but these are not consistent or continuous.

Structure--Subangular blocky or prismatic or it is massive.

Other features--These horizons have distinct or prominent mottles with hues of 7.5YR to 5G.

## Dacker Series

The Dacker series consists of moderately deep over duripan, well drained soils that formed in silty alluvium from mixed rock sources with a component of loess and volcanic ash. The Dacker soils are on fan piedmont remnants. Slopes are 0 to 8 percent. The mean annual precipitation is about 9 inches and the mean annual temperature is about 47 degrees F.

**Taxonomic class:** Fine-loamy, mixed, mesic Xerollic Durargids

**Typical pedon:** Dacker silt loam, 2 to 8 percent slopes, is located in an area of map unit 2809. (Colors are for dry soil unless otherwise noted.)

A1--0 to 3 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; moderate thin platy structure; soft, friable, slightly sticky and slightly plastic; few very fine roots; common fine vesicular pores; 5 percent pebbles; neutral (pH 6.6); abrupt smooth boundary. (2 to 4 inches thick)

A2--3 to 6 inches; brown (10YR 5/3) silt loam, dark brown (10YR 3/3) moist; moderate very fine subangular blocky structure; soft, friable, slightly sticky and slightly plastic; few very fine roots; common fine vesicular pores; neutral (pH 6.8); clear smooth boundary. (2 to 4 inches thick)

Bt1--6 to 11 inches; yellowish brown (10YR 5/4) silty clay loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; hard, firm, slightly sticky and slightly plastic; common very fine roots; few very fine tubular pores; common moderately thick clay films on faces of peds; mildly alkaline (pH 7.8); gradual smooth boundary. (4 to 13 inches thick)

Bt2--11 to 25 inches; light yellowish brown (10YR 6/4) silty clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; hard, firm, sticky and plastic; few medium, fine and very fine roots; few very fine tubular pores; common moderately thick clay films on faces of peds; 10 percent pebbles; mildly alkaline (pH 7.8); clear smooth boundary. (5 to 14 inches thick)

Bqk--25 to 32 inches; pale brown (10YR 6/3) silt loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; hard, firm, sticky and plastic; few fine and very fine roots; few fine tubular pores; 10 percent pebbles; weakly cemented with silica; 20 percent durinodes; strongly effervescent, lime is disseminated; moderately alkaline (pH 8.0); abrupt wavy boundary. (5 to 12 inches thick)

Bqkm1--32 to 52 inches; very pale brown (10YR 8/3) continuous indurated duripan with opal laminae 1/8 to 1/4 inches thick; very pale brown (10YR 7/3) moist; massive; extremely hard; violently effervescent; clear wavy boundary.



Bqkm2--52 to 60 inches; very pale brown (10YR 7/3) strongly cemented fractured duripan, pale brown (10YR 6/3) moist; massive; very hard dry consistence; violently effervescent.

**Type location:** Elko County, Nevada; in an unsectionized area, about 6.5 miles northwest of Josephine Reservoir; 41 degrees, 58 minutes, 30 seconds north latitude; 116 degrees, 31 minutes, 42 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Usually dry; moist in the winter and spring, dry June through October

*Soil temperature:* 47 to 52 degrees F.

*Combined thickness of A and Bt:* 17 to 25 inches.

*Depth to carbonates:* 15 to 25 inches.

*Depth to duripan:* 20 to 35 inches.

*Control section:*

Clay content--27 to 35 percent.

Rock fragments--5 to 35 percent, mainly pebbles.

*Other features:* Very gravelly loamy sand substrata are common in some pedons below a depth of 40 inches.

#### A horizons:

Value--5 or 6 dry, 3 or 4 moist.

Chroma--2 or 3.

Reaction--Neutral or mildly alkaline.

#### Bt horizons:

Value--5 through 7 dry, 3 through 5 moist.

Chroma--3 or 4.

Texture--Upper subhorizons: is silty clay loam or gravelly silty clay loam. Lower subhorizons: is silt loam, silty clay loam or gravelly silt loam.

Clay content--Upper subhorizons 27 to 35 percent, lower subhorizons 25 to 33 percent.

Rock fragments--Upper subhorizons 0 to 20 percent, lower subhorizons 5 to 35 percent.

Structure--Prismatic, subangular blocky or may be massive in the lower part.

Consistence--Usually hard, slightly hard in subhorizons, very friable to firm, moist; slightly sticky or sticky and slightly plastic or plastic, wet.

Reaction--Mildly alkaline or moderately alkaline.

#### Bqk horizon:

Value--6 or 7 dry, 3 through 5 moist.

Chroma--3 or 4.

Texture--Silt loam or loam, some pedons have gravelly silt loam or gravelly loam.

Clay content--20 to 25 percent.

Consistence--Slightly hard or hard, dry; very friable to firm, moist; slightly sticky or sticky and slightly plastic or plastic, wet.

Rock fragments--5 to 35 percent, mainly pebbles.

Other features--20 to 50 percent, 5 to 30 millimeter durinodes or pan fragments.

#### Bqkm horizons:

Value--6 through 8 dry, 4 through 7 moist.

Chroma--2 through 4.

Other features--Commonly has variable thickness of alternating layers of weak, strong or indurated silica-lime cemented material below.

## Deepeek Series

The Deepeek series consists of shallow, well drained soils that formed in mixed alluvium and colluvium. Deepeek soils are on fan piedmont remnants, plateaus and hills. Slopes are 8 to 50 percent. Mean annual precipitation is about 9 inches and the mean annual temperature is about 47 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic, shallow Xerollic Durargids

**Typical pedon:** Deepeek very cobbly loam, 8 to 15 percent slopes located in an area of map unit 3030. (Colors are for dry soil unless otherwise noted.) The soil surface is partially covered with approximately 20 percent pebbles and 10 percent cobbles.

Al--0 to 2 inches; pale brown (10YR 6/3) very cobbly loam, brown (10YR 4/3) moist; moderate thick platy structure parting to weak fine granular; slightly hard, very friable, slightly sticky and slightly plastic; many fine and common very fine roots; common medium vesicular and common fine tubular pores; 25 percent pebbles, 15 percent cobbles, 2 percent stones; mildly alkaline (pH 7.8); clear smooth boundary. (2 to 3 inches thick)

A2--2 to 5 inches; pale brown (10YR 6/3) very cobbly loam, brown (10YR 4/3) moist; weak thin platy structure parting to weak very fine granular; soft, very friable, slightly sticky and slightly plastic; few medium, common fine and very fine roots; common fine and very fine tubular pores; 25 percent pebbles, 15 percent cobbles; mildly alkaline (pH 7.8); gradual wavy boundary (2 to 3 inches thick)

Bt1--5 to 8 inches; pale brown (10YR 6/3) very cobbly loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few medium and common fine roots; few medium and common fine tubular pores; few thin clay films on faces of peds and lining pores; 15 percent pebbles, 20 percent cobbles; moderately alkaline (pH 8.0); clear wavy boundary. (3 to 5 inches thick)

Bt2--8 to 14 inches; very pale brown (10YR 7/3) very cobbly silty clay loam, yellowish brown (10YR 5/4) moist; moderate medium and fine subangular blocky structure; hard, firm, sticky and plastic; common

medium and fine roots; common medium and fine tubular pores; common thin clay films on peds, common moderately thick clay films lining pores; 20 percent pebbles; 30 percent cobbles; moderately alkaline (pH 8.4); clear smooth boundary. (5 to 9 inches thick)

**Bqk**--14 to 18 inches; white (10YR 8/2) very gravelly silt loam, pale brown (10YR 6/3) moist; massive; hard, firm, and brittle slightly sticky and slightly plastic; few medium and fine roots; few fine tubular pores; 40 percent pebbles, 5 percent cobbles; continuous brittle matrix, 25 percent brittle durinodes; strongly effervescent; lime is disseminated; strongly alkaline (pH 8.6); abrupt smooth boundary. (0 to 5 inches thick)

**Bqkm**--18 to 24 inches; white (10YR 8/2) indurated duripan, pale brown (10YR 6/3) moist; massive; extremely hard, extremely firm; few fine roots in fractures; silica laminae are 1/2 to 2 millimeters thick; violently effervescent; strongly alkaline (pH 8.8); clear smooth boundary. (5 to 8 inches thick)

**Cqk**--24 to 42 inches; white (10YR 8/2) gravelly silt loam, pale brown (10YR 6/3) moist; massive; hard, firm, slightly sticky and slightly plastic; few fine roots; 20 percent pebbles; continuous brittle matrix, 30 percent durinodes; 15 percent pebbles; strongly effervescent; lime is disseminated; strongly alkaline (pH 8.6).

**Type location:** Elko County, Nevada; Owyhee Desert, in an unsectionized area, about 14 miles northwest of Wilson Reservoir; 41 degrees, 47 minutes, 40 seconds north latitude, 116 degrees, 34 minutes, 00 seconds west longitude.

#### Range in Characteristics

**Soil moisture:** Usually dry; moist in winter and spring, dry in summer and early autumn

**Soil temperature:** 47 to 51 degrees F.

**Solum thickness:** 14 to 20 inches.

**Depth to duripan:** 14 to 20 inches.

**Depth to bedrock:** 40 to over 60 inches.

**Control section:**

Clay content--25 to 35 percent.

Rock fragments--35 to 50 percent, mainly pebbles and cobbles.

#### **Bt horizons:**

Value--5 through 7 dry, 4 or 5 moist.

Chroma--3 or 4.

Texture--Very cobbly silt loam, very cobbly loam, and very cobbly silty clay loam.

#### **Bqk horizons:**

Value--7 or 8 dry, 6 or 7 moist.

Chroma--2 through 4.

Durinodes--20 to 50 percent, inbedded in continuously brittle matrix.

## Deseed Series

The Deseed series consists of moderately deep, well drained soils that formed in residuum and colluvium from rhyolite, tuff and basalt. Deseed soils are on side slopes of hills and mountains. Slopes are 2 to 50 percent. Mean annual precipitation is 11 inches and the mean annual temperature is about 45 degrees F.

**Taxonomic class:** Fine, montmorillonitic, frigid Xerollic Haplargids

**Typical pedon:** Deseed gravelly loam, 15 to 30 percent slopes, located in map unit 2173. (Colors are for dry soil unless otherwise noted.) The soil surface is covered with 30 percent pebbles and 5 percent cobbles.

**A**--0 to 4 inches; pale brown (10YR 6/3) gravelly loam, dark brown (10YR 3/3) moist; moderate thick platy structure; soft, very friable, slightly sticky and slightly plastic; few fine and very fine roots; common very fine vesicular pores; 15 percent pebbles, 5 percent cobbles; neutral (pH 7.0); clear smooth boundary. (3 to 5 inches thick)

**Bt1**--4 to 10 inches; pale brown (10YR 6/3) gravelly clay loam, dark brown (10YR 3/3) moist; moderate fine subangular blocky structure; slightly hard, firm, sticky and plastic; few fine and very fine roots; few fine tubular pores; few thin clay films on peds and lining pores; 20 percent pebbles, 5 percent cobbles; neutral (pH 7.0); clear smooth boundary. (4 to 7 inches thick)

**Bt2**--10 to 17 inches; light yellowish brown (10YR 6/4) gravelly clay, brown (10YR 4/3) moist; moderate medium subangular blocky structure; hard, firm, sticky and plastic; few very fine roots; few fine tubular pores; common moderately thick clay films on peds; 25 percent pebbles, 5 percent cobbles; neutral (pH 7.0); clear smooth boundary. (6 to 8 inches thick)

**Bt3**--17 to 26 inches; brown (10YR 5/3) gravelly clay, yellowish brown (10YR 5/4) moist; strong medium subangular blocky structure; very hard, very firm, very sticky and very plastic; few very fine roots; few fine and very fine tubular pores; many moderately thick clay films on peds; 20 percent pebbles, 5 percent cobbles; neutral (pH 7.2); abrupt smooth boundary. (4 to 11 inches thick)

**R**--26 inches; rhyolite.

**Type location:** Elko County, Nevada; Owyhee Desert, in an unsectionized area, about 2 miles west of Haystack Peak; 41 degrees, 25 minutes, 45 seconds north latitude, 116 degrees, 23 minutes, 27 seconds west longitude.



### Range in Characteristics

*Soil moisture:* Usually dry; moist in winter and spring, dry late June through October

*Soil temperature:* 44 to 47 degrees F.

*Depth to bedrock:* 20 to 40 inches.

*Control section:*

Clay content--Average 35 to 45 percent.

Rock fragments--5 to 35 percent, mainly pebbles.

**A horizon:**

Value--5 or 6 dry, 3 or 4 moist.

Chroma--2 or 3 moist or dry.

**Bt1 horizon:**

Clay content--30 to 35 percent.

Texture--Silty clay loam or clay loam

Reaction--Neutral or mildly alkaline.

**Bt2 and Bt3 horizons:**

Hue--10YR or 7.5YR.

Value--4 through 6 dry, 4 or 5 moist.

Chroma--3 through 6.

Structure--Weak to strong, medium or coarse angular or subangular blocky, or weak prismatic.

Texture--Gravelly clay, gravelly clay loam, clay or clay loam.

Clay content--35 to 50 percent

Reaction--Neutral or mildly alkaline.

## Deunah Series

The Deunah series consists of moderately deep to a duripan, well drained soils that formed in alluvium and eolian material mainly from basalt and volcanic ash. Deunah soils are on plateaus and summits of hills. Slopes are 2 to 4 percent. The average annual precipitation is about 14 inches and the average annual temperature is about 44 degrees F.

**Taxonomic class:** Very-fine, montmorillonitic, frigid  
Abruptic Durixeralfs

**Typical pedon:** Deunah stony loam, 2 to 4 percent slopes, located in an area of map unit 2310. (Colors are for dry soil unless otherwise noted.) The soil surface is covered with 5 percent pebbles.

E1--0 to 2 inches; pale brown (10YR 6/3) loam, dark brown (10YR 3/3) moist; weak thin platy structure; slightly hard, very friable, nonsticky and nonplastic; common fine and very fine roots; few medium, many fine and very fine vesicular pores; 5 percent pebbles; slightly acid (pH 6.2); abrupt smooth boundary. (2 to 10 inches thick)

E2--2 to 9 inches; pale brown (10YR 6/3) loam, dark brown (10YR 3/3) moist; weak thin platy structure parting to moderate fine granular; slightly hard, very friable, slightly sticky and slightly plastic; many fine

and very fine roots; few fine and very fine tubular pores; 5 percent pebbles; slightly acid (pH 6.2); abrupt smooth boundary. (0 to 8 inches thick)

2Bt1--9 to 13 inches; brown (10YR 5/3) clay, dark brown (10YR 4/3) moist; moderate medium subangular blocky structure; hard, firm, sticky and plastic; common medium, fine and very fine roots; many fine and very fine tubular pores; common thin clay films on faces of peds and lining pores; 5 percent pebbles; slightly acid (pH 6.4); clear wavy boundary. (0 to 6 inches thick)

2Bt2--13 to 22 inches; brown (7.5YR 5/4) clay, dark brown (7.5YR 4/4) moist; moderate medium angular blocky structure; very hard, very firm, sticky and plastic; few medium fine and very fine roots; common fine and very fine tubular pores; many moderately thick clay films on faces of peds and lining pores; 10 percent pebbles; neutral (pH 6.6); abrupt wavy boundary. (4 to 20 inches thick)

2Bt3--22 to 26 inches; brown (7.5YR 5/4) clay, dark brown (7.5YR 4/4) moist; moderate medium and coarse prismatic structure parting to strong medium angular blocky; very hard, very firm, sticky and plastic; few fine and very fine roots; few very fine tubular pores; continuous moderately thick clay films on faces of peds and lining pores; many moderately thick stress surfaces; 10 percent pebbles; neutral (pH 7.0); abrupt wavy boundary. (0 to 4 inches thick)

2Bqm1--26 to 30 inches; yellow (10YR 7/6) indurated duripan, brownish yellow (10YR 6/6) moist; strong thick platy structure; very hard, very firm; few very fine roots; 10 percent pebbles; abrupt wavy boundary. (2 to 8 inches thick)

2Bqm2--30 to 33 inches; reddish yellow (7.5YR 7/6) continuous indurated duripan, light brown (7.5YR 6/4) moist; strong thick platy structure; extremely hard, extremely firm; 10 percent pebbles; abrupt wavy boundary. (0 to 5 inches thick)

R--33 inches; consolidated rhyolite.

**Type location:** Elko County, Nevada; approximately 1 mile south of Hatpeak; about 2,640 feet south and 2,150 feet west of the northeast corner of section 17, T. 46 N., R. 50 E.; 41 degrees, 53 minutes, 30 seconds north latitude, 116 degrees, 23 minutes, 10 seconds west longitude.

### Range in Characteristics

*Soil temperature:* 42 to 47 degrees F.

*Rock fragments in solum:* 0 to 15 percent

*Depth to duripan:* 20 to 34 inches

*Depth to bedrock:* 22 to 40 inches

**E horizons:**

Value--5 or 6 dry (more than 5.5 mixed), 3 or 4 moist

Chroma--2 or 3 moist and dry

Reaction--Moderately acid through neutral

**2Bt horizons:**

Hue--7.5YR or 10YR  
 Value--4 through 6 dry, 3 or 4 moist  
 Chroma--3 through 6 moist and dry  
 Clay content--60 to 70 percent  
 Reaction--Slightly acid to mildly alkaline

**2Bqm horizons:**

Hue--7.5YR or 10YR  
 Value--5 through 8 dry, 5 or 6 moist  
 Chroma--2 through 8 moist or dry  
 Rock fragments--10 to 80 percent  
 Effervescence--None or slight

**Dewar Series**

The Dewar series consists of well drained soils that are shallow to a duripan and formed in loess and silty alluvium from mixed rock sources with a component of volcanic ash. Dewar soils are on fan piedmont remnants. Slopes are 4 to 15 percent. The mean annual precipitation is about 9 inches and the mean annual temperature is about 47 degrees F.

**Taxonomic class:** Loamy, mixed, mesic, shallow  
 Xerollic Durargids

**Typical pedon:** Dewar very cobbly very fine sandy loam, 8 to 15 percent slopes, located in an area of map unit 2521. (Colors are for dry soil unless otherwise noted.) The soil surface is covered with 5 percent pebbles and 30 percent cobbles.

A1--0 to 2 inches; pale brown (10YR 6/3) very cobbly very fine sandy loam, dark brown (10YR 4/3) moist; weak thick platy structure; soft, very friable, slightly sticky and slightly plastic; few very fine roots; common fine vesicular pores; 5 percent pebbles and 30 percent cobbles; moderately alkaline (pH 8.2); abrupt smooth boundary. (2 to 5 inches thick)

A2--2 to 4 inches; pale brown (10YR 6/3) very cobbly silt loam, dark brown (10YR 4/3) moist; moderate thin platy structure; soft, very friable, slightly sticky and slightly plastic; few very fine roots; few very fine tubular pores; 15 percent pebbles; 25 percent cobbles; moderately alkaline (pH 8.2); clear smooth boundary. (0 to 3 inches thick)

Bt1--4 to 10 inches; pale brown (10YR 6/3) cobbly silty clay loam, dark brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, firm, sticky and plastic; few medium, fine and very fine roots; few fine tubular pores; few moderately thick clay films on faces of peds; 15 percent pebbles, 15 percent cobbles; moderately alkaline (pH 8.2); clear smooth boundary. (3 to 14 inches thick)

Bt2--10 to 14 inches; light yellowish brown (10YR 6/4) cobbly silty clay loam, yellowish brown (10YR 5/4)

moist; moderate medium subangular blocky structure; hard, firm, sticky and plastic; few fine and very fine roots; few very fine tubular pores; few moderately thick clay films on faces of peds; 5 percent pebbles, 15 percent cobbles; slightly effervescent; moderately alkaline (pH 8.2); clear smooth boundary. (0 to 5 inches thick)

Btqk--14 to 19 inches; very pale brown (10YR 7/3) very cobbly silt loam, light yellowish brown (10YR 6/4) moist; massive; hard, firm, slightly sticky and slightly plastic; few very fine roots; continuous brittle matrix, few thin clay films lining pores; 15 percent pebbles, 25 percent cobbles; violently effervescent; common fine soft masses of lime; strongly alkaline (pH 8.8); abrupt smooth boundary. (0 to 8 inches thick)

Bqkm1--19 to 22 inches; very pale brown (10YR 8/3) continuous fractured indurated duripan, very pale brown (10YR 7/3) moist; massive; extremely hard, extremely firm; violently effervescent; strongly alkaline (pH 8.8); abrupt smooth boundary. (3 to 5 inches thick)

Bqkm2--22 to 32 inches; very pale brown (10YR 8/3) continuous indurated duripan with 1/8 inch opal laminae, very pale brown (10YR 7/3) moist; massive; extremely hard, extremely firm; violently effervescent; strongly alkaline (pH 8.8); abrupt smooth boundary. (6 to 11 inches thick)

Ck1--32 to 42 inches; very pale brown (10YR 7/3) gravelly sandy loam, light yellowish brown (10YR 6/4) moist; massive; soft, very friable, nonsticky and nonplastic; 30 percent pebbles; violently effervescent, lime is disseminated; moderately alkaline (pH 8.2); gradual wavy boundary. (0 to 20 inches thick)

Ck2--42 to 60 inches; very pale brown (10YR 7/3) gravelly sandy loam, light yellowish brown (10YR 6/4) moist; massive; soft, very friable, nonsticky and nonplastic; 25 percent pebbles; violently effervescent, lime is disseminated; very strongly alkaline (pH 9.2).

**Type location:** Elko County, Nevada; in an unsectionized area, about 3 miles northwest of Winters Ranch Reservoir; 41 degrees, 34 minutes, 45 seconds north latitude, 116 degrees, 40 minutes, 17 seconds west longitude.

**Range in Characteristics**

*Soil moisture:* Usually dry; moist in winter and spring, dry early June through October

*Soil temperature:* 47 to 52 degrees F.

*Depth to indurated duripan:* 14 to 20 inches.

*Reaction:* A and Bt horizons are neutral to moderately alkaline.

*Control section:*

Clay content--27 to 35.

Rock fragments--15 to 35 percent dominantly pebbles and cobbles.



**A horizons:**

Value--3 or 4 moist.  
Chroma--2 or 3.

**Bt horizons:**

Value--6 through 7 dry, 3 through 5 moist.  
Chroma--2 through 4 dry, 3 or 4 moist.  
Texture--Gravelly silty clay loam or gravelly clay loam or cobbly silty clay loam.  
Clay content--27 to 35 percent.  
Rock fragments--15 to 35 percent, mainly pebbles and cobbles.  
Structure--Weak through strong, fine through coarse subangular blocky.  
Consistence--Slightly hard or hard, dry; very friable or friable, moist.

**Btqk horizon: (when present):**

Value--6 or 7 dry, 4 through 6 moist.  
Clay content--25 to 30 percent.  
Chroma--3 or 4.  
Durinodes--Weak or very weak, less than 30 percent.  
Silica cementation--Few thin pendants on pebbles or continuous brittle matrix.

**Bqkm horizons:**

Structure--Massive or moderately thick or very thick plate like layers.  
Cementation--Some pedons are alternately strongly cemented or discontinuously indurated horizons below the duripan.  
Other features--In some pedons, a 1 to 3 inch zone of degraded duripan material is common along the upper horizon boundary.

**Donna Series**

The Donna series consists of well drained soils that are moderately deep to a duripan. These soils formed in alluvium from mixed rock sources with a component of loess high in volcanic ash. Donna soils are on fan piedmont remnants. Slopes are 2 to 8 percent. The mean annual precipitation is about 11 inches and the mean annual temperature is about 44 degrees F.

**Taxonomic class:** Very-fine, montmorillonitic, frigid  
Abruptic Aridic Durixerolls

**Typical pedon:** Donna gravelly loam, 2 to 8 percent slopes, is located in an area of map unit 458.  
(Colors are for dry soil unless otherwise noted.)

A1--0 to 2 inches; light brownish gray (10YR 6/2) gravelly loam, very dark grayish brown (10YR 3/2) moist; weak thin platy structure; slightly hard, very friable, sticky and slightly plastic; common very fine and fine roots; common very fine tubular pores; 15

percent pebbles; neutral (pH 7.2); abrupt smooth boundary. (1 to 3 inches thick)

A2--2 to 7 inches; grayish brown (10YR 5/2) gravelly loam, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure; slightly hard, very friable, sticky and plastic; common very fine and fine roots; common very fine tubular pores; 15 percent pebbles; neutral (pH 7.2); clear smooth boundary. (1 to 5 inches thick)

A3--7 to 10 inches; brown (10YR 5/3) clay loam, dark brown (10YR 3/3) moist; moderate fine subangular blocky structure; hard, firm, sticky and plastic; common very fine and fine roots; common very fine tubular pores; few thin clay films lining pores in the lower part; many uncoated sand grains; 10 percent pebbles; neutral (pH 7.2); abrupt smooth boundary. (0 to 5 inches thick)

Bt1--10 to 19 inches; brown (10YR 5/3) clay, brown (10YR 4/3) moist; strong medium prismatic structure parting to strong angular blocky; very hard, very firm, very sticky and very plastic; few very fine and fine roots mainly along faces of peds; few very fine tubular pores; continuous stress surfaces on faces of peds; tops of prisms continuously covered with uncoated sand grains; 10 percent duripan fragments; neutral (pH 7.2); clear smooth boundary. (3 to 13 inches thick)

Bt2--19 to 24 inches; brown (10YR 5/3) clay, brown (10YR 4/3) moist; strong medium prismatic structure parting to strong medium angular blocky; very hard, very firm, very sticky and very plastic; few very fine roots mainly along faces of peds; few very fine tubular pores; continuous stress surfaces on faces of peds; 10 percent duripan fragments; neutral (pH 7.2); abrupt smooth boundary. (1 to 12 inches thick)

Bt3--24 to 30 inches; light yellowish brown (10YR 6/4) clay, dark yellowish brown (10YR 4/4) moist; massive; very hard, firm, very sticky and very plastic; few very fine roots; common very fine tubular pores; many thin and moderately thick clay films bridging sand grains and lining pores; few uncoated sand grains throughout; 10 percent coarse fragments 1/2 of which are duripan fragments, 1/2 of which are pebbles; mildly alkaline (pH 7.8); abrupt smooth boundary. (0 to 7 inches thick)

Bqkm--30 to 48 inches; indurated duripan with 2 to 5 millimeter silica laminar cap; multiple laminar throughout; strong thick platy structure; extremely hard and brittle; common fine soft lime seams along fracture planes; violently effervescent; moderately alkaline (pH 8.2); abrupt smooth boundary. (8 to 20 inches thick)

Cqk--48 to 60 inches; light yellowish brown (10YR 6/4) weakly stratified very gravelly sandy loam, yellowish brown (10YR 5/4) moist; massive; hard, friable, slightly sticky and slightly plastic; continuous brittle matrix; strongly effervescent, lime is disseminated; 55 percent pebbles; moderately alkaline (pH 8.2).

**Type location:** Elko County, Nevada; approximately 1/4 mile east of Tuscarora; about 800 feet north and 400 feet east of the southwest corner of section 35, T. 40 N., R. 51 E.; 41 degrees, 19 minutes, 00 seconds north latitude, 116 degrees, 15 minutes, 05 seconds west longitude.

### Range in Characteristics

*Soil moisture:* Usually dry; moist in winter and spring, dry mid June through October

*Soil temperature:* 44 to 47 degrees F.

*Mollic epipedon thickness:* 7 to 12 inches.

*Depth to duripan:* 20 to 36 inches.

*Thickness of duripan:* 10 to 20 inches.

*Other features:* There is an increase of 15 to 30 percent clay at the upper boundary of the Bt horizon.

### Control section:

Clay content--60 to 70 percent.

Rock fragments--0 to 15 percent, mainly pebbles.

### A horizons:

Hue--10YR or 7.5YR

Value--5 or 6 dry, 3 or 4 moist; 6 dry and 4 moist only in the upper 1 to 3 inches. After mixing the upper 7 inches the soil meets the 5.5 dry and 3.5 moist color requirements for mollic.

Chroma--2 or 3.

Reaction--Slightly acid or neutral.

### Bt horizons:

Hue--10YR or 7.5YR.

Value--5 or 6 dry, 4 or 5 moist.

Chroma--3 or 4.

Structure--Weak through strong medium or coarse prismatic, parting to angular blocky, massive in the lower part.

Consistence--Very hard or extremely hard, dry.

Reaction--Slightly acid or neutral. Some pedons are mildly alkaline in the subhorizon above the duripan.

### Bqkm horizon:

Reaction--Neutral or mildly alkaline where the upper subhorizons lack carbonates; moderately alkaline or strongly alkaline in the calcareous portions.

Other features--Commonly noncalcareous in the upper part but few or common fine soft lime seams are along fracture planes in some pedons.

## Enko Series

The Enko series consists of very deep, well drained soils that formed in loamy alluvium weathered mainly from mixed rock sources with a component of loess and volcanic ash. Enko soils are on fan piedmont remnants. Slopes are 0 to 15 percent. The mean

annual precipitation is about 9 inches and the mean annual temperature is about 47 degrees F.

**Taxonomic class:** Coarse-loamy, mixed, mesic Durixerollic Camborthids

**Typical pedon:** Enko fine sandy loam, 2 to 8 percent slopes, is located in an area of map unit 1241. (Colors are for dry soil unless otherwise noted.)

A1--0 to 4 inches; light brownish gray (10YR 6/2) fine sandy loam, very dark grayish brown (10YR 3/2) moist; moderate very thin platy structure; soft, very friable, slightly sticky and slightly plastic; many very fine roots; many very fine vesicular pores; moderately alkaline (pH 8.0); clear smooth boundary. (2 to 7 inches thick)

A2--4 to 8 inches; light brownish gray (10YR 6/2) fine sandy loam, very dark grayish brown (10YR 3/2) moist; moderate very thin platy structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine vesicular and tubular pores; moderately alkaline (pH 8.2); clear smooth boundary. (0 to 5 inches thick)

Bw--8 to 15 inches; pale brown (10YR 6/3) loam, dark brown (10YR 3/3) moist; moderate very fine and fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; many very fine and fine tubular pores; moderately alkaline (pH 8.2); clear smooth boundary. (6 to 14 inches thick)

Bqk1--15 to 26 inches; pale brown (10YR 6/3) loam, brown (10YR 4/3) moist; massive; hard, firm, brittle, slightly sticky and slightly plastic; few very fine and fine roots; common very fine tubular pores; continuous brittle matrix; slightly effervescent, lime is disseminated; moderately alkaline (pH 8.4); clear smooth boundary. (5 to 12 inches thick)

Bqk2--26 to 38 inches; light yellowish brown (10YR 6/4) fine sandy loam, dark yellowish brown (10YR 4/4) moist; massive; very hard, firm, brittle, slightly sticky and slightly plastic; few very fine roots; common very fine tubular pores; continuous brittle matrix; strongly effervescent, lime is disseminated; 10 percent pebbles; strongly alkaline (pH 9.0); clear smooth boundary. (8 to 15 inches thick)

Bqk3--38 to 60 inches; yellowish brown (10YR 5/4) fine sandy loam, dark yellowish brown (10YR 4/4) moist; massive; hard, firm, slightly sticky and slightly plastic; few very fine roots; common very fine tubular pores; 50 percent discontinuous weak silica cementation; strongly effervescent, lime is disseminated; 10 percent pebbles; strongly alkaline (pH 9.0).

**Type location:** Elko County, Nevada; approximately 16 miles south of Midas; about 2,100 feet north and 1,300 feet west of the southeast corner of section 2, T. 36 N., R 44 E.; 41 degrees, 01 minutes, 30



seconds north latitude, 116 degrees, 58 minutes,  
28 seconds west longitude.

### Range in Characteristics

*Soil moisture:* Usually dry; moist in winter and spring,  
dry June through October

*Soil temperature:* 49 to 54 degrees F.

*Thickness of A and Bw horizons:* 12 to 30 inches.

*Depth to continuous brittle matrix:* 14 to 32 inches.

*Other features:* Below 40 inches some pedons have  
gravelly or sandy substrata, or substrata containing  
gypsum crystals. Some pedons have  
noneffervescent Bq horizons above the Bqk horizon.

*Control section:*

Clay content--10 to 18 percent.

Rock fragments--0 to 15 percent pebbles.

#### A horizons:

Hue--10YR or 2.5Y.

Value--Commonly 6 or 7 dry, with 5 dry in some  
subhorizons of some pedons, 3 or 4 moist.

Chroma--2 or 3.

Reaction--Neutral through moderately alkaline.

#### Bw horizon:

Value--5 through 7 dry, 3 through 5 moist.

Chroma--2 through 4.

Texture--Mainly loam, fine sandy loam, or sandy  
loam; some pedons have strata of silt loam or  
clay loam in the upper part where stratified.

Structure--Prismatic, angular blocky, subangular  
blocky or it is massive.

Consistence--Nonsticky to sticky, nonplastic to  
plastic, wet.

Reaction--Neutral through moderately alkaline,  
increasing with depth.

Carbonates--Some pedons are calcareous in the  
lower portion of the horizon.

#### Bqk horizons:

Hue--10YR, 2.5Y, 5Y.

Value--4 through 7 moist, 6 through 8 dry.

Chroma--1 through 4 dry, 2 through 4 moist.

Texture--Loam, sandy loam, fine sandy loam,  
gravelly sandy loam, or very fine sandy loam.

Silica cementation--Continuous brittle matrix that  
has at least firm consistence when moist,  
horizons 10 to 40 inches thick. Subhorizons not  
continuously brittle contain 20 to 50 percent  
durinodes or are 20 to 75 percent discontinuous  
weakly silica-cemented.

Structure--Platy or is massive.

Consistence--Slightly hard to very hard, dry;  
nonsticky or slightly sticky and nonplastic or  
slightly plastic or brittle when wet. Substrata  
that are very friable, moist are in some pedons.

Reaction--Mildly alkaline through strongly alkaline  
increasing with depth.

Other features--Relict iron mottles or mica particles  
are common in many pedons. Very gravelly or  
extremely gravelly substratum phases are  
common below depths of 40 inches in some  
pedons.

## Erakatak Series

The Erakatak series consists of moderately deep,  
well drained soil that formed in residuum and colluvium  
from sedimentary and igneous rocks. Erakatak soils are  
mainly on south facing side slopes of hills and  
mountains. Slopes are 15 to 50 percent. The mean  
annual precipitation is about 16 inches and the mean  
annual temperature is about 44 degrees F.

**Taxonomic class:** Clayey-skeletal, montmorillonitic,  
frigid Typic Argixerolls

**Typical pedon:** Erakatak gravelly loam, 15 to 50  
percent slopes, is located in an area of map unit  
1742. (Colors are for dry soils unless otherwise  
noted.) The soil surface is covered with 15 percent  
pebbles.

A--0 to 4 inches; dark grayish brown (10YR 4/2)  
gravelly loam, black (10YR 2/1) moist; weak coarse  
subangular blocky structure; soft, very friable,  
slightly sticky and slightly plastic; common very  
fine, fine and medium roots; common very fine and  
fine tubular pores; 15 percent pebbles; neutral (pH  
7.2); clear smooth boundary. (1 to 8 inches thick)

Bt1--4 to 19 inches; grayish brown (10YR 5/2) very  
cobbly clay loam, very dark brown (10YR 2/2)  
moist; weak coarse subangular blocky structure;  
soft, very friable, sticky and plastic; common very  
fine, fine, medium and few coarse roots; common  
very fine and fine tubular pores; 15 percent pebbles  
and 25 percent cobbles; small pockets of dark  
yellowish brown (10YR 4/6) moist clay distributed  
randomly throughout; neutral (pH 7.2); abrupt wavy  
boundary. (6 to 15 inches thick)

Bt2--19 to 32 inches; dark yellowish brown (10YR 4/4)  
very cobbly clay, dark yellowish brown (10YR 4/4)  
moist; few fine distinct yellowish brown (10YR 5/8)  
moist, brownish yellow (10YR 6/8) moist, and  
strong brown (7.5YR 4/6 and 5/8) moist iron  
mottles; strong coarse and very coarse angular  
blocky structure; hard, firm, very sticky and very  
plastic; few very fine and fine roots; many very fine  
and fine tubular pores; many small iron-manganese  
concretions; many stress surfaces on faces of peds;  
20 percent pebbles and 35 percent cobbles; neutral  
(pH 7.0); abrupt wavy boundary. (12 to 22 inches  
thick)

Cr--32 to 35 inches; soft weathered siltstone; neutral  
(pH 6.8). (2 to 5 inches thick)

R--35 inches; hard, fractured siltstone.

**Type location:** Elko County, Nevada; about 2 miles south of Bull Run Reservoir; approximately 1,800 feet east and 1,800 feet north of the southwest corner of section 20, T. 43 N., R. 52 E.; 41 degrees, 36 minutes, 30 seconds north latitude, 116 degrees, 9 minutes, 30 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Usually moist winter and spring, dry late July through late October

*Soil temperature:* 42 to 47 degrees F.

*Mollic epipedon thickness:* 7 to 19 inches and includes the upper part of the argillic horizon.

*Soil thickness and depth to paralithic contact:* 20 to 35 inches.

*Depth to lithic contact:* 20 to 40 inches.

*Control section:*

Clay content--35 to 55 percent.

Rock fragments--35 to 60 percent, mainly cobbles.

#### A horizon:

Value--4 or 5 dry, 2 or 3 moist.

Chroma--1 through 3 dry or moist.

#### Bt horizons:

Hue--10YR or 7.5YR.

Value--4 through 6 dry, 2 through 4 moist with darker value in the upper subhorizon.

Chroma--2 through 4.

Texture--Very cobbly clay loam in the upper subhorizon and very cobbly clay in the lower subhorizon.

Consistence--Slightly sticky through very sticky and slightly plastic through very plastic, wet.

Reaction--Neutral or mildly alkaline.

Stress surfaces--Many present in at least part of the horizon.

Silica coats--Are present in some pedons.

Iron mottles--Common in the lower subhorizon of most pedons.

#### Cr horizon:

Normally contains 2 to 5 inches of weathered bedrock.

### Fulstone Series

The Fulstone series consists of shallow over a duripan, well drained soils that formed in alluvium from mixed rocks. Fulstone soils are on fan piedmonts remnants. Slopes are 2 to 30 percent. The mean annual precipitation is about 9 inches and the mean annual temperature is about 47 degrees F.

**Taxonomic class:** Clayey, montmorillonitic, mesic, shallow Abruptic Xerollic Durargids

**Typical pedon:** Fulstone gravelly loam, 2 to 8 percent slopes, located in an area of map unit 1230. (Colors are for dry soil unless otherwise noted.) Approximately 35 percent pebbles and 5 percent cobbles cover the soil surface.

A1--0 to 2 inches; light brownish gray (10YR 6/2) gravelly loam, dark grayish brown (10YR 4/2) moist; moderate very fine platy structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine roots; many fine vesicular pores; 25 percent pebbles; neutral (pH 7.0); clear smooth boundary. (1 to 4 inches thick)

A2--2 to 5 inches; pale brown (10YR 6/3) gravelly loam, dark brown (10YR 4/3) moist; strong very fine platy structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine and fine tubular pores; 15 percent pebbles, 2 percent cobbles; neutral (pH 7.0); abrupt smooth boundary. (2 to 4 inches thick)

Bt--5 to 17 inches; brown (10YR 5/3) clay, dark brown (10YR 4/3) moist; strong fine and coarse prismatic structure; hard, firm, sticky and plastic; few very fine and fine roots in mat; 5 percent pebbles, 2 percent cobbles; continuous thin clay films on faces of peds and lining pores; neutral (pH 7.3); abrupt smooth boundary. (6 to 20 inches thick)

Bqkm--17 to 40 inches; light yellowish brown (10YR 6/4) indurated silica and lime cemented duripan, dark yellowish brown (10YR 6/4) moist; massive; strongly effervescent.

**Type location:** Elko County, Nevada; approximately 9 miles northeast of Midas; about 1,700 feet west and 650 feet south of the northeast corner of section 28, T. 39 N., R. 47 E.; 41 degrees, 19 minutes, 18 seconds north latitude, 116 degrees, 39 minutes, 55 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Usually dry; moist in winter and spring, dry from June through October

*Soil temperature:* 53 to 59 degrees F.

*Depth to indurated duripan:* 14 to 20 inches.

*Other features:* Some pedons have a thin Bt3 horizon with clay or clay loam textures.

#### A horizons:

Value--5 or 6 dry, 3 or 4 moist.

Chroma--1 through 3.

Structure--Granular or platy.

Reaction--Slightly acid or neutral.

#### Bt horizon:

Hue--7.5YR or 10YR.

Value--4 through 6 dry, 3 or 4 moist.

Chroma--2 through 6.



Structure--Prismatic, angular blocky or subangular blocky.

Clay content--45 to 60 percent.

Rock fragments--Usually free of rock fragments, but some pedons average up to 20 percent pebbles or cobbles due to mixing by burrowing animals.

Reaction--Neutral through moderately alkaline.

**Bqkm horizon:**

Other features--Essentially continuously cemented, but broken in some places by burrowing animals.

## Gando Series

The Gando series consists of very shallow and shallow, well drained soils that formed in residuum and colluvium from chert, argillite, shale, quartzite, rhyolite or tuffaceous sandstone. Gando soils are on crests and side slopes of mountains. Slopes are 8 to 30 percent. The mean annual precipitation is about 16 inches and the mean annual temperature is about 42 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, frigid Lithic Haploxerolls

**Typical pedon:** Gando very gravelly loam, 15 to 30 percent slopes, from adjoining Elko County, Central Part soil survey. (Colors are for dry soil unless otherwise noted.) The surface is covered with approximately 70 percent pebbles.

A1--0 to 2 inches; grayish brown (10YR 5/2) very gravelly loam, very dark grayish brown (10YR 3/2) moist; weak very thin platy structure; soft, very friable, slightly sticky and nonplastic; common very fine roots; common very fine interstitial pores; 40 percent pebbles; mildly alkaline (pH 7.6); clear wavy boundary. (2 to 7 inches thick)

A2--2 to 9 inches; brown (10YR 5/3) very gravelly loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and few fine roots; common very fine and few fine tubular pores; 45 percent pebbles; mildly alkaline (pH 7.8); clear wavy boundary. (4 to 8 inches thick)

Bk--9 to 17 inches; pale brown (10YR 6/3) extremely gravelly loam, brown (10YR 4/3) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; few fine and very fine roots; few very fine tubular pores; common thin lime pendants on pebbles; 60 percent pebbles; slightly effervescent; moderately alkaline (pH 8.0); abrupt wavy boundary. (4 to 10 inches thick)

R--17 inches; very fractured tuffaceous sandstone with lime pendants along rock surfaces.

**Type location:** Elko County, Nevada; approximately 8 miles northeast of Elko; about 1,000 feet south and

1,900 feet west of the northeast corner of section 26, T. 35 N., R. 56 E.; 40 degrees, 53 minutes, 43 seconds north latitude, 115 degrees, 37 minutes, 44 seconds west longitude.

### Range in Characteristics

*Soil moisture:* Moist in winter through early summer, dry early July through mid October

*Soil temperature:* 43 to 46 degrees F.

*Mollic epipedon thickness:* 7 to 14 inches.

*Depth to bedrock:* 10 to 20 inches.

*Depth to carbonates:* 7 to 14 inches.

*Reaction:* Mildly or moderately alkaline, normally increasing with depth.

*Control section:*

Clay content--10 to 18 percent.

Rock fragments--50 to 70 percent, mainly pebbles.

**A horizons:**

Value--4 or 5 dry, 3 or 4 moist.

Chroma--2 or 3.

Consistence--Soft or slightly hard dry, slightly sticky to sticky and nonplastic to plastic moist.

**Bk horizon:**

Value--5 or 6 dry, 3 through 5 moist.

Chroma--3 or 4.

Structure--Subangular blocky, granular or is massive.

Consistence--Soft or slightly hard dry, slightly sticky to sticky and slightly plastic to plastic.

Texture--Extremely gravelly loam, extremely gravelly sandy loam or very gravelly loam.

Rock fragments--50 to 70 percent, mainly pebbles with up to 20 percent cobbles.

Carbonates--Slightly effervescent to strongly effervescent.

## Gochea Series

The Gochea series consists of very deep, well drained soils that formed in alluvium from mixed rock sources. The Gochea soils are on fan piedmont remnants. Slopes are 2 to 8 percent. The mean annual precipitation is about 12 inches and the mean annual temperature is about 45 degrees F.

**Taxonomic class:** Fine-loamy, mixed, frigid Durargidic Argixerolls

**Typical pedon:** Gochea gravelly loam, 2 to 4 percent slopes, is located in an area of map unit 150. (Colors are for dry soil unless otherwise noted.)

A1--0 to 2 inches; grayish brown (10YR 5/2) gravelly loam, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic;

many very fine roots; common very fine tubular pores; 20 percent pebbles; neutral (pH 7.0); clear smooth boundary. (2 to 5 inches thick)

A2--2 to 9 inches; brown (10YR 5/3) gravelly loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine roots; common very fine tubular pores; 15 percent pebbles; mildly alkaline (pH 7.4); clear smooth boundary. (2 to 8 inches thick)

Bt1--9 to 15 inches; brown (10YR 5/3) gravelly clay loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; hard, friable sticky and plastic; common very fine roots; common very fine tubular pores; few thin clay films lining pores; 25 percent pebbles; mildly alkaline (pH 7.4); abrupt smooth boundary. (4 to 9 inches thick)

Bt2--15 to 25 inches; brown (10YR 5/3) gravelly clay loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; hard, friable, sticky and plastic; few very fine roots; few very fine tubular pores; few thin clay films lining pores; 30 percent pebbles; mildly alkaline (pH 7.4); clear smooth boundary. (5 to 15 inches)

Bq1--25 to 30 inches; pale brown (10YR 6/3) gravelly loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; hard, firm, slightly sticky and slightly plastic; few very fine roots; common very fine tubular pores; 40 percent discontinuous weakly silica cemented lenses; 25 percent pebbles, 5 percent cobbles; mildly alkaline (pH 7.4); clear smooth boundary. (5 to 28 inches thick)

2Bq2--30 to 46 inches; grayish brown (10YR 5/2) extremely gravelly sand, dark grayish brown (10YR 4/2) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine roots; few very fine tubular pores; 50 percent weak discontinuous silica cementation; 20 percent durinodes; 75 percent pebbles; mildly alkaline (pH 7.4); clear smooth boundary. (12 to 28 inches thick)

2Bq3--46 to 60 inches; grayish brown (10YR 5/2) extremely gravelly sand, dark grayish brown (10YR 4/2) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine roots; few very fine tubular pores; 80 percent weak discontinuous silica cementation; 65 percent pebbles; mildly alkaline (pH 7.4).

**Type location:** Elko County, Nevada; approximately 6 miles east of Tuscarora; about 1,000 feet north of the southeast corner of section 27, T. 40 N., R. 52 E.; 41 degrees, 19 minutes, 45 seconds north latitude, 116 degrees, 6 minutes, 10 seconds west longitude.

### Range in Characteristics

*Soil moisture:* Usually dry; moist winter and spring, dry mid June through October

*Soil temperature:* 43 to 47 degrees F.

*Mollic epipedon thickness:* 10 to 15 inches which commonly includes the upper part of the argillic horizon.

*Depth to Bq horizons:* 18 to 25 inches.

*Other features:* 2Bk horizons are in some pedons.

*Control section:*

Clay content averages 25 to 35 percent.

Rock fragment--5 to 35 percent, mainly pebbles.

#### A horizons:

Value--4 or 5 dry, 2 or 3 moist.

Chroma--2 or 3.

Reaction--Neutral or mildly alkaline.

#### Bt horizons:

Value--5 or 6 dry, 3 or 4 moist.

Chroma--2 through 4.

Texture--Clay loam or sandy clay loam.

Clay content--25 to 35 percent.

Rock fragments--5 to 35 percent, mainly pebbles.

Structure--Subangular or angular blocky.

Reaction--Neutral or mildly alkaline.

#### Bq horizons:

Value--5 through 7 dry, 3 through 5 moist.

Chroma--2 through 4.

Texture--Sandy loam or loam.

Structure--Subangular blocky or massive.

Rock fragments--0 to 30 percent, mainly pebbles and cobbles.

Consistence--Slightly hard or hard; dry; friable or firm, moist.

Silica cementation--20 to 80 percent durinodes or has up to 50 percent weak discontinuous cementation.

Reaction--Mildly alkaline to strongly alkaline.

#### 2Bq horizons:

Value--4 or 5 moist.

Texture--Very gravelly or extremely gravelly sand.

Clay content--2 to 8 percent.

Rock fragments--50 to 75 percent, mainly pebbles.

Consistence--Slightly hard or hard, dry; very friable through firm, moist. Layers with secondary silica are continuously brittle in some pedons.

Silica cementation--Up to 80 percent weak discontinuous cementation.

Secondary carbonates--None to many lime coats on rock fragments.

Effervescence--None to slight.



## Graley Series

The Graley series consists of shallow, well drained soils that formed in residuum from mixed rock sources. Graley soils are on side slopes of mountains and hills. Slopes are 4 to 50 percent. The mean annual precipitation is about 14 inches and the mean annual temperature is about 44 degrees F.

**Taxonomic class:** Clayey-skeletal, montmorillonitic, frigid Lithic Argixerolls

**Typical pedon:** Graley stony loam, 4 to 15 percent slopes, is located in an area of map unit 1621. (Colors are for dry soil unless otherwise noted.) The soil surface is covered with 5 percent pebbles, 5 percent cobbles and 2 percent stones.

A1--0 to 7 inches; grayish brown (10YR 5/2) stony loam, very dark grayish brown (10YR 3/2) moist; moderate fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine roots; many very fine tubular pores; 5 percent pebbles, 5 percent cobbles, 2 percent stones; mildly alkaline (pH 7.6); clear smooth boundary. (1 to 7 inches thick)

A2--7 to 12 inches; brown (10YR 5/3) gravelly loam, dark brown (10YR 3/3) moist; moderate fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and few fine roots; many very fine tubular pores; 15 percent pebbles, 5 percent cobbles; mildly alkaline (pH 7.6); clear smooth boundary. (2 to 8 inches thick)

Bt--12 to 17 inches; brown (7.5YR 5/4) very gravelly clay loam, dark brown (7.5YR 4/4) moist; moderate medium subangular blocky structure; hard, firm, sticky and plastic; common very fine roots; common very fine tubular pores; continuous thin clay films on faces of peds and lining pores; 40 percent pebbles; mildly alkaline (pH 7.8); abrupt smooth boundary. (5 to 10 inches thick)

R--17 inches; consolidated bedrock.

**Type location:** Elko County, Nevada; approximately 7 miles northeast of Midas; about 1,800 feet west and 3,400 feet north of the southeast corner of section 24, T. 39 N., R. 46 E.; 41 degrees, 19 minutes, 55 seconds north latitude, 116 degrees, 43 minutes, 30 seconds west longitude.

### Range in Characteristics

**Soil moisture:** Usually moist; moist in winter and spring, dry mid July through late October

**Soil temperature:** 42 to 47 degrees F.

**Mollic epipedon thickness:** 7 to 12 inches, does not include the argillic horizon.

**Depth to bedrock:** 14 to 20 inches.

**Reaction:** Neutral or mildly alkaline.

### Control section:

Clay content--35 to 50 percent.

Rock fragments--35 to 60 percent, mainly pebbles.

### A horizons:

Value--4 or 5 dry.

Chroma--2 or 3.

### Bt horizon:

Hue--7.5YR or 10YR.

Value--5 or 6 dry, 3 or 4 moist.

Chroma--3 or 4.

Texture--Very gravelly clay loam, or very gravelly clay.

Structure--Angular or subangular blocky.

Consistence--Very hard or hard, dry, sticky or very sticky and plastic or very plastic, wet.

## Gumble Series

The Gumble series consists of shallow, well drained soils that formed in residuum from tuff. Gumble soils are on fan piedmont remnants and hill side slopes. Slopes are 4 to 50 percent. The mean annual precipitation is about 9 inches and the mean annual temperature is about 47 degrees F.

**Taxonomic class:** Clayey, montmorillonitic, mesic, shallow Xerollic Haplargids

**Typical pedon:** Gumble very gravelly sandy loam, 2 to 8 percent slopes, is located in an area of map unit 1853. (Colors are for dry soils unless otherwise noted.) The surface is partially covered with 30 percent pebbles.

Al--0 to 2 inches; light brownish gray (10YR 6/2) very gravelly sandy loam, very dark grayish brown (10YR 3/2) moist; weak thick platy structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine roots; many very fine and common fine interstitial pores; 35 percent pebbles; neutral (pH 7.2); clear wavy boundary. (2 to 4 inches thick)

A2--2 to 4 inches; light gray (10YR 7/2) gravelly loam, dark grayish brown (10YR 4/2) moist; moderate thick platy structure; slightly hard, friable, slightly sticky and plastic; many very fine and common fine roots; many very fine interstitial and few fine tubular pores; 25 percent pebbles; neutral (pH 7.0); abrupt wavy boundary. (2 to 6 inches thick)

Bt1--4 to 9 inches; brown (10YR 5/3) clay, dark brown (10YR 3/3) moist; strong medium prismatic structure parting to strong medium angular blocky; very hard, very firm, very sticky and very plastic; common very fine roots; few very fine interstitial pores; continuous distinct stress surfaces on faces of peds; 5 percent pebbles; mildly alkaline (pH 7.4); clear wavy boundary. (5 to 7 inches thick)

Bt2--9 to 13 inches; brown (10YR 5/3) clay, brown (10YR 4/3) moist; moderate medium prismatic parting to strong medium angular blocky; very hard, very firm, very sticky and very plastic; common very fine expd roots; common very fine interstitial pores; many moderately thick clay films on faces of peds and lining pores; 5 percent pebbles; mildly alkaline (pH 7.5); clear wavy boundary. (2 to 6 inches thick)

Btk--13 to 18 inches; pale brown (10YR 6/3) silty clay, brown (10YR 4/3) moist; weak medium prismatic structure; very hard, firm, very sticky and very plastic; few very fine roots; common very fine interstitial and few fine tubular pores; few moderately thick clay films on faces of peds; common fine irregularly shaped lime filaments; 5 percent pebbles; strongly effervescent; moderately alkaline (pH 8.0); clear wavy boundary. (0 to 3 inches thick)

Cr--18 to 24 inches; pale brown (10YR 6/3) soft siltstone, dark brown (10YR 4/3) moist; few fine prominent dark yellowish brown mottles.

**Type location:** Elko County, Nevada; approximately 5 miles south of Wilson Reservoir; about 2,640 feet north and 530 feet east of the southwest corner of section 28, T. 43 N., R. 60 E.; 41 degrees, 35 minutes, 45 seconds north latitude, 116 degrees, 22 minutes, 30 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Usually dry; moist in winter and spring

*Soil temperature:* 47 to 50 degrees F.

*Solum thickness:* 14 to 20 inches.

*Depth to paralithic contact:* 14 to 20 inches.

*Control section:*

Clay content 40 to 60 percent.

Rock fragments--5 to 35 percent, mostly pebbles with up to 10 percent cobbles in some pedons.

Reaction--Neutral to mildly alkaline in the upper solum and mildly to moderately alkaline in the lower part.

#### A horizons:

Value--5 through 7 dry, 3 or 4 moist.

Chroma--2 or 3.

#### Bt1 and Bt2 horizons:

Value 5 or 6 dry, 3 or 4 moist.

Chroma--3 or 4.

Texture--Clay or gravelly clay.

Sand fraction--More than 15 percent sand coarser than very fine sand.

#### Btk horizons:

Value--4 or 5 moist.

Chroma--3 or 4.

Texture--Silty clay loam or silty clay.

Rock fragments--0 to 5 percent.

## Hackwood Series

The Hackwood series consists of very deep, moderately well drained soils that formed in colluvium derived from volcanic quartzite and conglomerate rocks. Hackwood soils are on side slopes of hills and mountains. Slopes are 4 to 50 percent. The mean annual precipitation is about 18 inches and the mean annual temperature is about 42 degrees F.

**Taxonomic class:** Fine-loamy, mixed Pachic Cryoborolls

**Typical pedon:** Hackwood silt loam, 4 to 15 percent slopes, located in an area of map unit 1640. (Colors are for dry soil unless otherwise noted.)

A1--0 to 4 inches; brown (10YR 4/3) silt loam, black (10YR 2/1) moist; moderate very thin platy structure; soft, friable, slightly sticky and slightly plastic; many coarse and common very fine roots; common very fine tubular pores; 5 percent pebbles; neutral (pH 7.0); clear smooth boundary. (2 to 12 inches thick)

A2--4 to 12 inches; brown (10YR 5/3) silt loam, very dark brown (10YR 2/2) moist; weak fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine, many fine, medium and coarse roots; many very fine tubular pores; 10 percent pebbles; neutral (pH 6.8); clear smooth boundary. (7 to 25 inches thick)

A3--12 to 26 inches; brown (10YR 5/3) loam, very dark brown (10YR 2/2) moist; weak fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many fine and medium, common very fine roots; common very fine tubular pores; 15 percent pebbles; neutral (pH 6.8); abrupt irregular boundary. (0 to 9 inches thick)

A4--26 to 34 inches; brown (10YR 5/3) gravelly loam, very dark grayish brown (10YR 3/2) moist; weak fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many fine and medium, common very fine roots; common very fine tubular pores; 15 percent pebbles; neutral (pH 6.8); abrupt irregular boundary. (0 to 9 inches thick)

2C--34 to 60 inches; light gray (10YR 7/2) very gravelly loam, grayish brown (10YR 5/2) moist; massive; hard, friable, slightly sticky and slightly plastic; few fine roots; common fine tubular pores; 60 percent pebbles; silt coatings lining pores; neutral (pH 6.8).

**Type location:** Elko County, Nevada, in an unsectionized area, approximately 7 miles west of Midas; 41 degrees, 15 minutes, 07 seconds north latitude, 116 degrees, 54 minutes, 53 seconds west longitude.



### Range in Characteristics

*Soil moisture:* Usually moist late fall through mid-summer, dry late summer through mid fall.  
Additional soil moisture supplied by lateral water movement in lower part of the control section or substratum

*Average soil temperature:* 38 to 44 degrees F.

*Average summer soil temperature:* 43 to 47 degrees F.

*Mollic epipedon thickness:* 16 to 35 inches.

*Depth to the 2C horizons:* 30 to 49 inches.

*Reaction:* Neutral or slightly acid, decreasing with depth.

#### Control section:

Clay content--Averages 18 to 30 percent.

Rock fragments--Averages 15 to 35 percent, mainly pebbles.

Texture--silt loam, gravelly silt loam and gravelly loam, lower part commonly very gravelly loam to very gravelly silty clay loam.

#### A horizons:

Value--4 or 5 dry, 2 or 3 moist.

Chroma--1 through 3 dry, 1 or 2 moist.

#### 2C horizon:

Hue--2.5Y or 10YR.

Value--5 through 7 dry, 4 or 5 moist.

Chroma--2 or 3.

Texture--Very gravelly loam to very gravelly silty clay loam.

Structure--Subangular blocky or is massive.

Consistence--Slightly hard or hard, dry; very friable or friable, moist; slightly sticky or sticky and slightly plastic or plastic, wet.

Other features--Lower C horizons: Pores lined with very thin silt coats or uncoated sand grains.  
Some pedons have few to common fine distinct 10YR 5/6 dry and 4/4 moist mottles. Some pedons have few manganese stains coating pebbles and lining pores.

## Handy Series

The Handy series consists of very deep, well drained soils that formed in alluvium and colluvium from igneous rocks with some influence from limestone and dolomite. Handy soils are on hills, fan piedmonts and mountain valley fans. Slopes are 2 to 50 percent. The mean annual precipitation is about 11 inches and the mean annual temperature is about 44 degrees F.

**Taxonomic class:** Fine, montmorillonitic, frigid Xerollic Haplargids

**Typical pedon:** Handy loam, 15 to 30 percent slopes, located in an area of map unit 3000. (Colors are for dry soil unless otherwise noted.)

A1--0 to 2 inches; pale brown (10YR 6/3) loam, dark brown (10YR 4/3) moist; weak thin platy structure; soft, very friable, slightly sticky and slightly plastic; common fine and very fine roots; few fine vesicular pores; 10 percent pebbles; neutral (pH 7.2); clear smooth boundary. (2 to 6 inches thick)

A2--2 to 5 inches; brown (10YR 5/3) loam, dark brown (10YR 4/3) moist; weak medium platy structure; soft very friable, slightly sticky and slightly plastic; common fine and very fine roots; few fine tubular pores; 5 percent pebbles; neutral (pH 7.2); clear smooth boundary. (0 to 4 inches thick)

BA--5 to 10 inches; pale brown (10YR 6/3) loam, dark brown (10YR 4/3) moist; weak medium subangular blocky structure; slightly hard, friable, sticky and plastic; few fine and very fine roots; few fine tubular pores; 10 percent pebbles; neutral (pH 7.2); clear smooth boundary. (2 to 8 inches thick)

Bt--10 to 22 inches; yellowish brown (10YR 5/4) clay, dark yellowish brown (10YR 4/4) moist; moderate coarse prismatic structure parting to strong medium and fine angular blocky; extremely hard, extremely firm, very sticky and very plastic; few fine roots; few fine tubular pores; many moderately thick clay films on faces of peds; 10 percent pebbles; neutral (pH 7.2); clear smooth boundary. (4 to 14 inches thick)

Btk--22 to 28 inches; light yellowish brown (10YR 6/4) clay, dark yellowish brown (10YR 4/4) moist; moderate medium angular blocky structure; hard, firm, sticky and plastic; few fine roots; few fine tubular pores; common moderately thick clay films on faces of peds; 10 percent pebbles; strongly effervescent in few thin filaments of lime, noneffervescent matrix; mildly alkaline (pH 7.4); clear smooth boundary. (0 to 15 inches thick)

Bk1--28 to 40 inches; light yellowish brown (10YR 6/4) gravelly loam, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure; hard, firm, sticky and plastic; few fine tubular pores; 15 percent pebbles; lime is disseminated, strongly effervescent; moderately alkaline (pH 7.6); clear smooth boundary. (0 to 12 inches thick)

Bk2--40 to 47 inches; pale brown (10YR 6/3) gravelly loam, dark brown (10YR 4/3) moist; massive; hard, firm, slightly sticky and plastic; few fine tubular pores; 15 percent pebbles; lime is disseminated, strongly effervescent; moderately alkaline (pH 7.6); clear smooth boundary. (5 to 9 inches thick)

Bk3--47 to 60 inches; pale brown (10YR 6/3) gravelly loam, dark brown (10YR 4/3) moist; massive; hard, firm, slightly sticky and plastic; few fine tubular pores; 15 percent pebbles; lime is disseminated, strongly effervescent; moderately alkaline (pH 7.6).

**Type location:** Elko County, Nevada; approximately 18 miles north of Midas; 41 degrees, 28 minutes, 58 seconds north latitude, 116 degrees, 39 minutes, 25 seconds west longitude.

**Range in Characteristics**

*Soil moisture:* Usually dry; moist in winter and spring, dry June through October

*Soil temperature:* 45 to 47 degrees F.

*Depth to lime:* 12 to 23 inches.

*Depth to Bk horizon:* 20 to 40 inches.

*Control section:*

Clay content--40 to 50 percent.

Rock fragments--0 to 30 percent, mainly pebbles.

**A horizons:**

Value--4 to 6 dry (greater than 5.5 when the surface 7 inches are mixed), 3 or 4 moist.

Chroma--2 or 3.

**BA horizon:**

Value--5 or 6 dry

Texture--Loam or gravelly clay loam.

Structure--Granular or subangular blocky.

**Bt and Btk horizons:**

Hue--10YR or 7.5YR, with 5YR in some pedons.

Value--5 or 6 dry, 4 or 5 moist.

Chroma--2 to 4.

Texture--Clay or gravelly clay.

Structure--Moderate or strong angular blocky or prismatic.

Reaction--Neutral through moderately alkaline, commonly increasing with depth.

**Bk horizons:**

Texture--Stratified gravelly loam to very gravelly loamy sand.

Rock fragments--15 to 60 percent, mainly pebbles.

Other features--Slightly to violently effervescent.

Reaction--Moderately alkaline to strongly alkaline.

**Hapgood Series**

The Hapgood series consists of deep and very deep, well drained soils that formed in alluvium and colluvium from mixed rocks. Hapgood soils are on hills and mountain side slopes. Slopes are 15 to 75 percent. The mean annual precipitation is about 18 inches and the mean annual temperature is about 42 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed Pachic Cryoborolls

**Typical pedon:** Hapgood very gravelly loam, 30 to 50 percent slopes, is located in an area of map unit 570. (Colors are for dry soil unless otherwise noted.)

A1--0 to 3 inches; dark grayish brown (10YR 4/2) very gravelly loam, very dark brown (10YR 2/2) moist; weak thin platy structure; soft, very friable, slightly

sticky and slightly plastic; many very fine roots; many very fine interstitial pores; 40 percent pebbles; slightly acid (pH 6.4); clear wavy boundary. (0 to 7 inches thick)

A2--3 to 13 inches; dark grayish brown (10YR 4/2) very gravelly loam, very dark brown (10YR 2/2) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine, common fine, few medium and coarse roots; many very fine tubular pores; 40 percent pebbles; neutral (pH 6.2); gradual wavy boundary. (4 to 10 inches thick)

A3--13 to 21 inches; brown (10YR 5/3) very gravelly loam, dark brown (10YR 3/3) moist; weak fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine, common fine and few medium roots; many very fine tubular pores; 40 percent pebbles; neutral (6.6); clear wavy boundary. (6 to 20 inches thick)

C1--21 to 41 inches; pale brown (10YR 6/3) very gravelly loam, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; common very fine tubular pores; 45 percent pebbles; slightly acid (pH 6.2); clear smooth boundary. (10 to 25 inches thick)

C2--41 to 55 inches; pale brown (10YR 6/3) very gravelly sandy loam, brown (10YR 4/3) moist; massive; slightly hard, very friable, nonsticky and slightly plastic; few very fine roots; few very fine tubular pores; 30 percent pebbles, 10 percent cobbles; slightly acid (pH 6.4).

R--55 inches; hard quartzite.

**Type location:** Elko County, Nevada; approximately 7 miles west of Tuscarora, about 800 feet east and 1,600 feet north of the southeast corner of section 02, T 39 N., R. 50 E.; 41 degrees, 17 minutes, 55 seconds north latitude, 116 degrees, 20 minutes, 10 seconds west longitude.

**Range in Characteristics**

*Soil moisture:* Moist in winter and spring, dry late July through early October

*Soil temperature:* 38 to 47 degrees F.

*Average summer soil temperature:* 55 to 59 degrees F.

*Mollic epipedon thickness:* 16 to 60 inches.

*Depth to bedrock:* 40 to more than 80 inches.

*Reaction:* Slightly acid or neutral.

*Control section:*

Clay content--18 to 27 percent.

Rock fragments--35 to 50 percent, dominantly pebbles.

**A horizons:**

Hue--10YR or 7.5YR

Value--2 through 5 dry, 2 or 3 moist.



Chroma--1 through 3 in most pedons, chroma of 1 is common only in A1 horizon and chroma of 3 is common only in A3 horizon or below.  
Base saturation--50 to 75 percent in upper part.

#### C horizons:

Hue--10YR or 7.5YR.  
Value--4 through 7 dry, 3 through 5 moist.  
Chroma--2 through 6.  
Texture--Predominantly loam, but strata of fine sandy loam, sandy loam, silt loam or clay loam are permissible.  
Consistence--Very friable or friable, moist.  
Other features--Some pedons lack C horizons where the mollic epipedon rests on the bedrock at depths less than 48 inches.

### Hatpeak Series

The Hatpeak series consists of moderately deep, well drained soils that formed in alluvium from basalt, rhyolite and tuff with a small component of loess. Hatpeak soils are on fan piedmont remnants and on plateaus. Slopes are 2 to 15 percent. Mean annual precipitation is about 14 inches and the mean annual temperature is about 44 degrees F.

**Taxonomic class:** Fine, montmorillonitic, frigid Typic Durixerolls

**Typical pedon:** Hatpeak loam, 2 to 4 percent slopes, located in an area of map unit 3715. (Colors are for dry soil unless otherwise noted.)

A1--0 to 3 inches; brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure parting to moderate very fine subangular blocky; soft, friable, slightly sticky and slightly plastic; many very fine roots; common very fine tubular pores; neutral (pH 7.2); abrupt smooth boundary. (3 to 4 inches thick)

A2--3 to 10 inches; brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; moderate very fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots; common very fine tubular pores; neutral (pH 7.2); clear smooth boundary. (3 to 7 inches thick)

Bt1--10 to 12 inches; pale brown (10YR 6/3) silty clay loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; hard, firm, sticky and plastic; few fine and very fine roots; few thin clay films on faces of peds; 5 percent cobbles; mildly alkaline (pH 7.4); clear smooth boundary. (2 to 9 inches thick)

Bt2--12 to 19 inches; pale brown (10YR 6/3) silty clay, brown (10YR 4/3) moist; strong fine angular blocky structure; very hard, very firm, very sticky and very plastic; few fine and very fine roots; few fine and very fine tubular pores; common moderately thick

clay films on faces of peds; 5 percent cobbles; mildly alkaline (pH 7.4); clear smooth boundary. (5 to 7 inches thick)

Bt3--19 to 30 inches; yellowish brown (10YR 5/4) silty clay, dark yellowish brown (10YR 3/4) moist; strong medium prismatic structure; extremely hard, very firm, very sticky and very plastic; few very fine roots; many moderately thick clay films on faces of peds; mildly alkaline (pH 7.4); gradual wavy boundary. (4 to 11 inches thick)

Bqkm1--30 to 38 inches; light yellowish brown (10YR 6/4) fractured indurated duripan, dark yellowish brown (10YR 4/4) moist; strong thick and very thick platy structure; very hard, very firm, strongly effervescent; strongly alkaline (pH 9.0); gradual wavy boundary. (0 to 8 inches thick)

Bqkm2--38 to 60 inches; white (10YR 8/2) continuous indurated duripan, light gray (10YR 7/2) moist; massive; extremely hard, extremely firm; opal laminae 1/8 to 1/4 inch thick; strongly effervescent.

**Type location:** Elko County, Nevada; Owyhee Desert, in an unsectionized area, approximately 20 miles north of Wilson Reservoir; 41 degrees, 59 minutes, 25 seconds north latitude, 116 degrees, 27 minutes, 05 seconds west longitude.

#### Range in Characteristics

**Soil moisture:** Moist in winter and spring, dry from mid July through October

**Soil temperature:** 44 to 47 degrees F.

**Mollic epipedon thickness:** 8 to 15 inches.

**Depth to duripan:** 20 to 34 inches.

**Depth to bedrock:** 40 to over 60 inches.

**Control section:**

Clay content--35 to 50 percent.

Rock fragments--Up to 15 percent, mainly cobbles.

#### A horizons:

Value--2 or 3 moist.

Chroma--2 or 3.

#### Bt horizons:

Value--3 or 4 moist.

Texture--Silty clay loam, silty clay, clay loam and clay.

Structure--Prismatic, angular or subangular blocky.

Reaction--Neutral or mildly alkaline.

#### Bqkm horizons:

Value--4 through 7 moist.

Chroma--2 through 4.

Consistence--Very hard or extremely hard, dry.

Other features--Some pedons have a strongly silica cemented duripan below the indurated duripan.

## Heechee Series

The Heechee series consists of very deep, well drained soils that formed in alluvium from mixed rock sources. They are on fan piedmont remnants. Slopes are 4 to 15 percent. The mean annual precipitation is about 14 inches; the mean annual temperature is about 43 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, frigid Typic Argixerolls

**Typical pedon:** Heechee cobbly loam, 4 to 15 percent slopes is in an area of map unit 1261. (Colors are for dry soil unless otherwise noted.) The soil surface is partially covered with 15 percent pebbles and 10 percent cobbles.

A1--0 to 3 inches; grayish brown (10YR 5/2) cobbly loam, very dark grayish brown (10YR 3/2) moist; weak coarse platy structure parting to moderate medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine roots; many fine, common very fine tubular pores; 10 percent pebbles and 10 percent cobbles; neutral (pH 7.0); abrupt smooth boundary. (2 to 5 inches thick)

A2--3 to 7 inches; dark grayish brown (10YR 4/2) cobbly loam, very dark grayish brown (10YR 3/2) moist; strong coarse subangular blocky structure; hard, friable, sticky and plastic; common very fine and fine, few medium tubular pores; 10 percent pebbles and 5 percent cobbles; neutral (pH 7.0); abrupt smooth boundary. (4 to 12 inches)

2Bt1--7 to 14 inches; brown (10YR 5/3) very cobbly clay loam, dark brown (10YR 3/3) moist; weak coarse prismatic structure parting to moderate medium angular blocky; hard, friable, sticky and plastic; few very fine through medium roots; common very fine, few fine tubular pores; few thin clay films lining pores; 20 percent pebbles and 15 percent cobbles; neutral (pH 7.0); clear smooth boundary. (5 to 12 inches thick)

2Bt2--14 to 27 inches; brown (7.5YR 4/4) very cobbly clay loam, dark brown (7.5YR 3/4) moist; moderate medium angular blocky structure; hard, friable, sticky and plastic; few very fine through medium roots; common very fine, few fine and medium tubular pores; few thin clay films lining pores; 20 percent pebbles and 15 percent cobbles; neutral (pH 6.8); clear smooth boundary. (10 to 18 inches thick)

2C--27 to 61 inches; brown (7.5YR 5/4) extremely cobbly sandy loam, dark brown (7.5YR 3/4) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; few very fine through medium roots; few very fine tubular pores; 25 percent pebbles, 35 percent cobbles, 5 percent stones; neutral (pH 6.8)

**Type location:** Elko County, Nevada; approximately 12 miles northeast of Tuscarora; about 2,300 feet east and 800 feet north of the southwest corner of section 13, T. 41 N., R. 52 E.; 41 degrees, 26 minutes, 45 seconds north latitude, 116 degrees, 4 minutes, 35 seconds west longitude.

### Range in Characteristics

**Soil moisture:** Usually moist; moist in winter and spring, dry mid July through early October

**Soil temperature:** 44 to 47 degrees F.

**Mollic epipedon thickness:** 12 to 20 inches, includes the upper part of the argillic horizon.

**Depth to base of argillic horizons:** 27 to 40 inches.

**Other features:** In some small areas on plateaus, some pedons are recognized with a paralithic contact at 50 to 60 inches.

**Control section:**

Clay content--25 to 35 percent.

Rock fragments--35 to 60 percent; 20 to 45 percent pebbles, 15 to 25 percent cobbles, 0 to 10 percent stones.

**A horizons:**

Value--4 or 5 dry, 2 or 3 moist.

Chroma--1 through 3.

**Bt horizons:**

Hue--7.5YR or 10 YR.

Value--4 through 6 dry, 3 through 5 moist.

Chroma--2 through 4.

Texture--Very cobbly clay loam, very gravelly sandy clay loam or very cobbly loam.

Structure--Prismatic or angular blocky.

**C horizon:**

Hue--7.5YR or 10 YR.

Value--5 or 6 dry, 3 or 4 moist.

Chroma--4 through 6.

Texture--Extremely cobbly loam, extremely cobbly sandy loam; extremely cobbly coarse sandy loam and coarser textures are common in some pedons below 40 inches.

Rock fragments--60 to 80 percent, mainly cobbles and stones.

Structure--Subangular blocky or is massive.

## Humboldt Series

The Humboldt series consists of very deep, poorly drained soils that formed in silty alluvium from mixed rock sources with a component of volcanic ash. Humboldt soils are on flood plains. Slopes are 0 to 2 percent. The mean annual precipitation is about 7 inches and the mean annual temperature is about 50 degrees F.



**Taxonomic class:** Fine, montmorillonitic (calcareous),  
mesic Fluvaquentic Haplaquolls

**Typical pedon:** Humboldt silty clay loam, located in an area of map unit 280. (Colors are for dry soil unless otherwise noted.)

Ap--0 to 6 inches; dark grayish brown (10YR 4/2) silty clay loam, very dark brown (10YR 2/2) moist; weak medium subangular blocky structure; slightly hard, friable, sticky and plastic; many very fine and fine roots; many very fine and fine tubular pores; strongly effervescent; strongly alkaline (pH 8.6); clear smooth boundary. (2 to 12 inches thick)

A--6 to 12 inches; grayish brown (2.5Y 5/2) silty clay loam, very dark grayish brown (2.5Y 3/2) moist; few fine distinct light yellowish brown (10YR 6/4) mottles; moderate fine and medium subangular blocky structure; hard, friable, sticky and plastic; many very fine and fine roots; many very fine tubular and interstitial pores; strongly effervescent; strongly alkaline (pH 8.7); abrupt wavy boundary. (5 to 9 inches thick)

C--12 to 20 inches; light brownish gray (2.5Y 6/2) silty clay, dark grayish brown (2.5Y 4/2) moist; few fine distinct light yellowish brown (10YR 6/4) mottles; strong fine and medium angular blocky structure; hard, firm, very sticky and very plastic; many very fine and common fine roots; common very fine tubular and interstitial pores; strongly effervescent; strongly alkaline (pH 8.8); abrupt smooth boundary. (0 to 10 inches thick)

Ck1--20 to 30 inches; light gray (2.5Y 7/2) silty clay loam, grayish brown (2.5Y 5/2) moist; moderate medium angular blocky structure; hard, firm, sticky and plastic; common very fine and few medium roots; common very fine tubular and interstitial pores; few fine filaments and threads of lime; strongly effervescent; strongly alkaline (pH 9.0); abrupt wavy boundary. (2 to 20 inches thick)

Ck2--30 to 52 inches; light gray (2.5Y 7/2) silty clay, grayish brown (2.5Y 5/2) moist, thin lenses of dark silt loam are common; massive; hard, firm, very sticky and very plastic; common very fine and few medium roots; common very fine tubular and interstitial pores; few fine soft masses of lime; strongly effervescent; strongly alkaline (pH 9.0); abrupt smooth boundary. (15 to 30 inches)

Ab--52 to 60 inches; grayish brown (2.5Y 5/2) crudely stratified silt loam, very dark grayish brown (2.5Y 3/2) moist; massive; slightly hard, friable, slightly sticky and very plastic; few very fine roots; many very fine interstitial pores; strongly alkaline (pH 8.8).

**Type location:** Elko County, Nevada; approximately 14 miles southwest of Midas; about 150 feet east and 600 feet south of the northwest corner of section 3, T. 37 N., R. 44 E.; 41 degrees, 7 minutes, 10

seconds north latitude, 117 degrees, 00 minutes, 31 seconds west longitude.

### Range in Characteristics

**Soil moisture:** Usually saturated for one month or more during most years unless drained

**Soil temperature:** 50 to 54 degrees F.

**Mollic epipedon thickness:** 10 to 24 inches.

**Reaction:** Mildly alkaline to very strongly alkaline, the higher values being only in sodium affected areas.

**Carbonates:** Slightly effervescent to strongly effervescent throughout; some strata below 20 inches in some pedons are noneffervescent. The calcium carbonate equivalent is less than 15 percent.

**Iron mottles:** Distinct or prominent iron mottles are on the lower part of the mollic epipedon or immediately below; or if no mottles, matrix chroma is 1 or less.

**Other features:** Some pedons have stratified silt loam to fine sand below 30 inches. Buried A horizons common.

#### Control section:

Clay content--35 to 45 percent.

Texture--Stratified silty clay loam to clay with minor substrata of silt loam in some pedons.

#### A horizons:

Hue--10YR or 2.5Y or N.

Value--4 or 5 dry, 6 on surface of some pedons due to deposition, 2 or 3 moist.

Chroma--0 through 2.

#### C and Ck horizons:

Hue--10YR to 5GY or N.

Value--6 or 7 dry, 3 through 5 moist. Volcanic ash layers are 8 dry, 6 moist.

Chroma--0 through 3.

Structure--Moderate or strong prismatic or blocky in the upper part; weak medium and coarse subangular blocky structure in the lower part, or it is massive.

Carbonates--Few to many very fine to medium lime concretions or soft segregations in some subhorizons.

## Hunnton Series

The Hunnton series consists of moderately deep over a duripan, well drained soils that formed in alluvium from mixed rock sources with a component of loess and volcanic ash. The Hunnton soils are on summits, side slopes and foot slopes of fan piedmont remnants, partial ballenas and plateaus. Slopes are 1 to 30 percent. The mean annual precipitation is about 9 inches and the mean annual air temperature is about 48 degrees F.

**Taxonomic class:** Fine, montmorillonitic, mesic Xerollic Durargids

**Typical pedon:** Hunnton silt loam, 2 to 8 percent slopes, is located in an area of map unit 1229. (Colors are for dry soil unless otherwise noted.) The soil surface is partially covered with 20 percent pebbles.

- A--0 to 3 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; moderate very thin platy structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine, and few medium roots; many very fine and fine interstitial pores; 5 percent pebbles; mildly alkaline (pH 7.4); clear smooth boundary. (2 to 6 inches thick)
- Bt1--3 to 6 inches; light brownish gray (10YR 6/2) silty clay loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; hard, friable, very sticky and very plastic; common very fine roots; common very fine tubular pores; 5 percent pebbles; few moderately thick clay films; moderately alkaline (pH 8.0); clear smooth boundary. (3 to 7 inches thick)
- Bt2--6 to 13 inches; light yellowish brown (10YR 6/4) clay, brown (10YR 4/3) moist; moderate fine prismatic structure parting to strong medium angular blocky; hard, firm, very sticky and very plastic; common very fine roots; few very fine tubular pores; 5 percent pebbles; many thick clay films on faces of peds and lining pores; moderately alkaline (pH 8.2); clear smooth boundary. (5 to 10 inches thick)
- Bt3--13 to 23 inches; yellowish brown (10YR 5/4) clay, dark yellowish brown (10YR 4/4) moist; moderate very coarse angular blocky structure; hard, firm, sticky and plastic; few very fine roots; few very fine tubular pores; many stress surfaces; few thin and moderately thick clay films lining pores and bridging sand grains; 5 percent pebbles; moderately alkaline (pH 8.2); abrupt wavy boundary. (0 to 12 inches thick)
- Btqk--23 to 36 inches; pale brown (10YR 6/3) clay, dark brown (10YR 3/3) moist; moderate coarse angular blocky structure; hard, firm, sticky and plastic; few very fine roots; few very fine tubular pores; few moderately thick clay films lining pores and on face of peds; 15 percent durinodes in a friable matrix; common silica coats on peds; common fine, irregularly shaped soft masses of lime; slightly effervescent; 5 percent pebbles; moderately alkaline (pH 8.2); abrupt wavy boundary. (0 to 15 inches thick)
- Bqkm--36 to 44 inches; very pale brown (10YR 8/3) indurated duripan pale brown (10YR 6/3) moist; continuous laminar capping 2 to 4 millimeter thick; strongly effervescent.

**Type location:** Elko County, Nevada; approximately 1 mile South of Wilson Reservoir; about 600 feet

south and 6,300 feet west of the northwest corner of section 7, T. 43 N., R. 50 E.; 41 degrees, 32 minutes, 45 seconds north latitude, 116 degrees, 19 minutes, 25 seconds west longitude.

### Range in Characteristics

*Soil moisture:* Usually dry, moist mid fall through spring, dry from summer through early fall

*Soil temperature:* 47 to 52 degrees F.

*Depth to duripan:* 20 to 40 inches.

*Depth to lime:* 19 to 32 inches.

*Other features:* Some pedons have a 4 to 11 inch thick Bq horizon above the duripan that is brittle or discontinuous weakly silica cemented.

*Control section:*

*Clay content--40 to 55 percent*

*Rock fragments--Average 5 to 25 percent*

### A horizons:

Value--5 or 6 dry, 3 or 4 moist.

Chroma--2 or 3.

Reaction--Neutral through moderately alkaline.

### Bt horizons:

Hue--10YR or 7.5YR.

Value--5 through 7 dry, 3 through 5 moist.

Chroma--2 through 4.

Texture--Clay or gravelly clay.

Clay content--40 to 55 percent.

Rock fragments--Up to 25 percent, mainly pebbles.

Structure--Weak or moderate, very fine to very coarse subangular or angular blocky or prismatic.

Consistence--Slightly hard or very hard dry; sticky or very sticky and plastic or very plastic, wet.

Reaction--Neutral through moderately alkaline.

Effervescence--Noneffervescent in the upper subhorizons, noneffervescent to strongly effervescent in the lower subhorizons.

Other features--Some pedons have a 4 to 7 inch thick loam, silty clay loam or clay loam

Bt1 horizon with few thin clay films. Some pedons have lime masses and silica concretions in the lower portion of the horizon.

### Bqkm horizon:

Value--7 or 8 dry, 4 through 7 moist.

Chroma--2 or 3 dry, 3 or 4 moist.

Structure--Massive, or has weak medium to very thick platy structure.

Other features--Some pedons have strongly silica cemented horizons with 40 to 60 percent pebbles below the indurated duripan.

## Kelk Series

The Kelk series consists of very deep, well drained soils that formed in loess with some influence from volcanic ash and mixed silty alluvium derived mainly



from mixed rock sources. The Kelk soils are on inset fans, inset fan remnants, fan piedmont remnants, partial ballenas, stream terraces, drainage channels, alluvial plains, axial stream floodplains and fan skirts. Slopes are 0 to 15 percent. The mean annual precipitation is about 8 inches and the mean annual temperature is 48 degrees F.

**Taxonomic class:** Fine-silty, mixed, mesic Durixerollic Camborthids

**Typical pedon:** Kelk very fine sandy loam, 0 to 2 percent slopes, located in an area of map unit 2545. (Colors are for dry soil unless otherwise noted.)

A1--0 to 2 inches; pale brown (10YR 6/3) very fine sandy loam, dark brown (10YR 3/3) moist; weak thin platy structure; slightly hard, very friable, sticky and plastic; few very fine roots; few coarse and medium, many fine and very fine tubular pores; neutral (pH 6.8); abrupt smooth boundary. (2 to 4 inches thick)

A2--2 to 4 inches; pale brown (10YR 6/3) silt loam, dark brown (10YR 3/3) moist; moderate thin platy structure; slightly hard, very friable, sticky and plastic; few very fine roots; few very fine tubular pores; neutral (pH 6.8); abrupt smooth boundary. (0 to 4 inches thick)

Bw--4 to 13 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; hard, friable, sticky and plastic; few fine and very fine roots; few fine and very fine tubular pores; neutral (pH 7.2); clear smooth boundary. (6 to 28 inches thick)

Bq--13 to 25 inches; light yellowish brown (10YR 6/4) silt loam, dark yellowish brown (10YR 4/4) moist; moderate medium angular blocky structure; hard, firm and brittle, sticky and plastic; few fine and very fine roots; few fine and very fine tubular pores; continuous brittle matrix; strongly effervescent; mildly alkaline (pH 7.4); gradual wavy boundary. (0 to 15 inches thick)

Bqk1--25 to 36 inches; light yellowish brown (10YR 6/4) silt loam, dark yellowish brown (10YR 4/4) moist; moderate medium angular blocky structure; hard, firm and brittle, sticky and plastic; few very fine roots; few very fine tubular pores; continuous brittle matrix; mildly alkaline (pH 7.4); gradual wavy boundary. (10 to 34 inches thick)

Bqk2--36 to 48 inches; light yellowish brown (10YR 6/4) silt loam, dark yellowish brown (10YR 4/4) moist; massive; hard, friable, sticky and plastic; few very fine roots; few very fine tubular pores; 30 percent brittle durinodes; strongly effervescent; lime is in few fine seams and filaments; moderately alkaline (pH 8.4); gradual wavy boundary. (0 to 13 inches thick)

Bk--48 to 60 inches; light yellowish brown (10YR 6/4) silt loam, dark yellowish brown (10YR 4/4) moist; massive; hard, firm, sticky and plastic; common

very fine tubular pores; violently effervescent; lime is in few fine seams and filaments; strongly alkaline (pH 8.6)

**Type location:** Elko County, Nevada; in an unsectionized area, about 30 miles north of Midas; 41 degrees, 40 minutes, 23 seconds north latitude, 116 degrees, 53 minutes, 55 seconds west longitude.

#### Range in Characteristics

**Soil moisture:** Usually dry; moist in the winter and spring, dry from early June through October

**Soil temperature:** 47 to 52 degrees F.

**Depth to base of Bw horizons:** 10 to 35 inches.

**Depth to continuous brittle matrix:** 13 to 35 inches.

**Depth to carbonates:** 12 to 35 inches.

**Other features:** These soils are normally slightly or moderately salt affected below 24 to 48 inches.

**Control section:**

Clay content--18 to 27 percent.

#### A horizons:

Hue--10YR or 2.5Y.

Value--5 through 7 dry, 3 or 4 moist.

Chroma--2 or 3.

Effervescence--Noneffervescent or slightly effervescent.

#### Bw horizons:

Value--6 or 7 dry, 3 or 4 moist.

Chroma--2 or 3.

Structure--Blocky or prismatic or it is massive.

Consistence--Very friable or friable, moist; sticky or slightly plastic or plastic, wet.

Reaction--Neutral to moderately alkaline. It is strongly alkaline when affected by salts and sodium.

Effervescence--Noneffervescent or slightly effervescent.

Other features--There are 10 to 20 percent weak durinodes near the lower horizon boundary in some pedons.

#### Bq and Bqk horizons:

Value--6 through 8 dry, and 3 through 6 moist.

Chroma--2 through 4.

Texture--Dominantly silt loam with thin strata of silty clay loam common in some pedons below 30 inches.

Structure--Moderate fine and medium subangular blocky or massive.

Consistence--Very friable to firm and brittle, moist; slightly sticky or sticky and slightly plastic or plastic, wet.

Reaction--Neutral through strongly alkaline, increasing with depth.

Effervescence--Slightly effervescent through violently effervescent in the Bqk horizon.

Cementation--Subhorizons without continuously brittle matrix contain 30 to 90 percent durinodes or are 20 to 50 percent discontinuous weakly silica cemented.

*Other features:* Some pedons have lenses of 5 to 15 percent pebbles in some Bqk subhorizon or extremely gravelly substrata below 42 inches. Some pedons have silty clay loam 2Bk horizons below 39 inches.

## Kleckner Series

The Kleckner series consists of very deep, well drained soils that formed in alluvium from mixed rock sources and in some areas colluvium from welded tuff or rhyolite. Kleckner soils are on fan piedmont remnants and mountain valley fan remnants and hills. Slopes are 2 to 50 percent. The mean annual precipitation is about 11 inches and the mean annual temperature is about 43 degrees F.

**Taxonomic class:** Clayey-skeletal, montmorillonitic, frigid Aridic Argixerolls

**Typical pedon:** Kleckner silt loam, 2 to 8 percent slopes, is located in map unit 141. (Colors are for dry soil unless otherwise noted.) The soil surface is partially covered with 10 percent pebbles.

A1--0 to 2 inches; brown (10YR 5/3) gravelly loam, dark brown (10YR 3/3) moist; moderate very fine platy structure; soft, very friable, slightly sticky and slightly plastic; many very fine roots; many very fine vesicular pores; 15 percent pebbles; slightly acid (pH 6.2); clear smooth boundary. (2 to 4 inches thick)

A2--2 to 8 inches; brown (10YR 5/3) gravelly loam, dark brown (10YR 3/3) moist; moderate very fine platy structure; soft, very friable, slightly sticky and plastic; common very fine roots; few very fine tubular pores; 20 percent pebbles; slightly acid (pH 6.4); clear smooth boundary. (4 to 8 inches thick)

Bt1--8 to 13 inches; brown (10YR 5/3) very gravelly clay loam, dark brown (10YR 3/3) moist; moderate fine and medium subangular blocky structure; slightly hard, friable, sticky and plastic; common very fine roots; few very fine and fine tubular pores; few thin clay films lining pores; 30 percent pebbles, 10 percent cobbles; slightly acid (pH 6.4) clear smooth boundary. (2 to 5 inches thick)

Bt2--13 to 20 inches; light yellowish brown (10YR 6/4) very gravelly clay, dark yellowish brown (10YR 4/4) moist; moderate fine and medium subangular blocky structure; hard, firm, very sticky and very plastic; common very fine and few medium roots; few very fine and fine tubular pores; 30 percent pebbles, 10 percent cobbles; neutral (pH 6.6); clear smooth boundary. (10 to 20 inches thick)

Bt3--20 to 42 inches; light yellowish brown (10YR 6/4) very cobbly clay, dark yellowish brown (10YR 4/4) moist; moderate fine subangular blocky structure; hard, firm, very sticky and very plastic; common very fine and fine roots; few very fine tubular pores; many moderately thick clay films on faces of peds and lining pores; 30 percent pebbles, 20 percent cobbles; neutral (pH 7.0); gradual smooth boundary. (10 to 25 inches thick)

Bq--42 to 60 inches; light yellowish brown (10YR 6/4) extremely gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; common very fine roots; common cobbles, few fine silica coats on pebbles; neutral (pH 7.0)

**Type location:** Elko County, Nevada; approximately 5 miles southeast of Midas; about 1,600 feet west and 1,200 feet south of the northeast corner of section 3, T. 38 N., R. 45 E.; 41 degrees, 12 minutes, 12 seconds north latitude, 116 degrees, 52 minutes, 42 seconds west longitude.

### Range in Characteristics

*Soil moisture:* Moist in winter and spring, dry early July through October

*Soil temperature:* 44 to 47 degrees F.

*Mollic epipedon thickness:* 10 to 16 inches. It includes the upper part of the argillic horizon.

*Depth to Bq horizons:* 40 to 60 inches.

*Control section:*

Clay content--35 to 50 percent.

Rock fragments--35 to 60 percent; mainly pebbles or cobbles.

### A horizons:

Value--4 or 5 dry, 2 or 3 moist.

Chroma--2 or 3.

Reaction--Slightly acid to mildly alkaline.

### Bt horizons:

Hue--7.5YR or 10YR.

Value--5 through 7 dry, 3 through 5 moist. Darker values are common only in the upper subhorizons.

Chroma--3 through 6.

Texture--Very cobbly clay, very cobbly clay loam, very gravelly clay loam, loam or very gravelly clay in the upper part and gravelly clay loam, very gravelly clay or very cobbly clay in the lower part. Loam is common in some pedons at depths below 35 inches.

Reaction--Neutral or mildly alkaline.

### Bq horizon:

Cementation--Contain 20 to 40 percent durinodes or has continuous brittle matrix that is hard and firm.

Reaction--Neutral to moderately alkaline.



Other features--Some pedons have lime in the lower subhorizons. Some pedons lack durinodes or weak silica cementation, but have silica coats or pendants on rock fragments.

## Kortty Series

The Kortty series consists of deep, well drained soils that formed in alluvium and loess from mixed sources. Kortty soils are on fan piedmont remnants. Slopes are 0 to 2 percent. Mean annual precipitation is about 9 inches and the mean annual temperature is about 47 degrees F.

**Taxonomic class:** Fine-loamy, mixed, mesic Duric Haplargids

**Typical pedon:** Kortty silt loam, 0 to 2 percent slopes, located in an area of map unit 1156. (Colors are for dry soil unless otherwise noted.)

A1--0 to 3 inches; very pale brown (10YR 7/3) silt loam, brown (10YR 5/3) moist; weak coarse platy structure; slightly hard, very friable, nonsticky and nonplastic; few fine roots; few coarse and medium, many fine and very fine vesicular pores; 5 percent pebbles; strongly alkaline (pH 8.8); abrupt wavy boundary. (2 to 4 inches thick)

A2--3 to 6 inches; light gray (10YR 7/2) silt loam, brown (10YR 5/3) moist; moderate fine platy structure, slightly hard, very friable, slightly sticky and slightly plastic; common fine and few very fine roots; few fine vesicular and tubular pores; 5 percent pebbles; moderately alkaline (pH 8.4); abrupt wavy boundary. (2 to 7 inches thick)

Bt--6 to 12 inches; light yellowish brown (10YR 6/4) clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; few fine and very fine roots; few fine tubular pores; common thin clay films on faces of peds and lining pores; 5 percent pebbles; strongly alkaline (pH 8.6); abrupt wavy boundary. (5 to 7 inches thick)

Bq--12 to 15 inches; very pale brown (10YR 7/4) loam, yellowish brown (10YR 5/4) moist; weak medium subangular blocky structure; hard, firm and brittle, slightly sticky and slightly plastic; few fine and very fine roots; few very fine tubular pores; 5 percent pebbles; continuous brittle matrix, 5 percent brittle durinodes; strongly alkaline (pH 8.8); clear wavy boundary. (0 to 4 inches thick)

Bqk1--15 to 30 inches; very pale brown (10YR 7/4) loam, yellowish brown (10YR 5/4) moist; massive; hard, firm, and brittle; slightly sticky and slightly plastic; few fine and very fine roots; few very fine tubular pores; 5 percent pebbles; continuous brittle matrix, 25 percent brittle durinodes; strongly

effervescent; strongly alkaline (pH 8.8); abrupt wavy boundary. (4 to 17 inches thick)

Bqk2--30 to 42 inches; very pale brown (10YR 7/3) gravelly silt loam, brown (10YR 5/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few fine and very fine roots; 15 percent pebbles; 10 percent brittle durinodes; common fine lime filaments; violently effervescent; moderately alkaline (pH 8.4); gradual wavy boundary. (11 to 14 inches thick)

2Bqk3--42 to 55 inches; very pale brown (10YR 7/3) very gravelly sandy loam, brown (10YR 5/3) moist; massive; hard, firm, nonsticky and nonplastic; few very fine roots; 40 percent pebbles; continuous brittle matrix; common fine lime filaments; violently effervescent; moderately alkaline (pH 8.2); clear wavy boundary. (10 to 20 inches thick)

2Bqkm--55 to 60 inches; white (10YR 8/2) strong silica cemented duripan, light yellowish brown (10YR 6/4) moist; massive; extremely hard, very firm; violently effervescent; moderately alkaline (pH 8.2).

**Type location:** Elko County, Nevada; Owyhee Desert, in an unsectionized area, approximately 28 miles west of Josephine Reservoir; 41 degrees, 55 minutes, 40 seconds north latitude, 116 degrees, 58 minutes, 23 seconds west longitude.

### Range in Characteristics

*Soil moisture:* Usually dry; moist in winter and spring, dry in summer and autumn

*Soil temperature:* 47 to 53 degrees F.

*Solum thickness and depth to silica cementation:* 9 to 18 inches.

*Depth to lime:* 12 to 22 inches.

*Depth to 2Bqk horizons:* 32 to 50 inches.

*Depth to duripan:* 50 to 60 inches.

*Control section:*

Clay content--25 to 35 percent.

Rock fragments--0 to 15 percent, mainly pebbles.

### A horizons:

Value--6 or 7 dry, 4 or 5 moist.

Chroma--2 or 3.

Consistence--Very friable or friable, moist.

### Bt horizon:

Texture--Loam or clay loam.

Structure--Subangular or angular blocky.

Reaction--Moderately alkaline or strongly alkaline.

Consistence--Slightly hard or hard, dry; slightly sticky or sticky and slightly plastic or plastic wet.

### Bq and Bqk horizons:

Value--7 or 8 dry, 5 or 6 moist.

Chroma--2 to 4.

Texture--Loam, gravelly loam, gravelly silt loam or gravelly fine sandy loam.

Rock fragments--5 to 20 percent

Other features--Commonly slightly saline affected at some depth below 30 inches.

#### 2Bqk horizons:

Rock fragments--35 to 50 percent, mainly pebbles.  
Consistence--Slightly hard or hard, dry; very friable through firm, moist.  
Cementation--20 to 40 percent weakly silica cemented durinodes or has continuous brittle matrix.

### Lerrow Series

The Lerrow series consists of moderately deep, well drained soils that formed in residuum and colluvium from welded tuff, andesite, rhyolite, shale, quartzite or chert. Lerrow soils are on hills, mountains and side slopes of fan piedmont remnants with rock core. Slopes are 4 to 50 percent. The mean annual precipitation is about 12 inches and the mean annual temperature is about 44 degrees F.

**Taxonomic class:** Fine, montmorillonitic, frigid Aridic Argixerolls

**Typical pedon:** Lerrow cobbly loam, 15 to 50 percent slopes, is located in an area of the map unit 126. (Colors are for dry soil unless otherwise noted.) The surface is partially covered with 30 percent pebbles.

A1--0 to 3 inches; pale brown (10YR 6/3) cobbly loam, dark brown (10YR 3/3) moist; weak medium platy structure; slightly hard, friable, slightly sticky and slightly plastic; few medium, common very fine and fine roots; common fine and medium vesicular pores; 20 percent cobbles, 10 percent pebbles; neutral (pH 7.0); clear smooth boundary. (1 to 3 inches thick)

A2--3 to 9 inches; brown (10YR 5/3) loam; dark brown (10YR 3/3) moist; weak medium platy structure; hard, firm, slightly sticky and slightly plastic; common very fine and fine roots; common very fine and fine tubular pores; 10 percent pebbles; neutral (pH 7.2); clear smooth boundary. (1 to 7 inches thick)

Bt1--9 to 14 inches; brown (10YR 5/3) gravelly clay loam, dark brown (10YR 3/3) moist; weak medium platy structure; hard, firm, sticky and plastic; common very fine and fine roots; few very fine tubular pores; few thin clay films lining pores; 20 percent pebbles, 5 percent cobbles; mildly alkaline (pH 7.4); clear smooth boundary. (4 to 11 inches thick)

Bt2--14 to 19 inches; brown (10YR 5/3) gravelly clay, brown (10YR 4/3) moist; weak medium subangular blocky structure; hard, firm, sticky and plastic; few very fine and fine roots; common very fine and fine tubular pores; common moderately thick clay films lining pores and on faces of peds; 15 percent

pebbles, 5 percent cobbles; mildly alkaline (pH 7.6); clear smooth boundary. (5 to 11 inches thick)  
Bt3--19 to 27 inches; yellowish brown (10YR 5/4) clay, dark yellowish brown (10YR 4/4) moist; weak medium prismatic structure; hard, firm, sticky and plastic; few very fine and few fine roots; few very fine tubular pores; common thin clay films lining pores and on faces of peds; 5 percent pebbles and 5 percent cobbles; mildly alkaline (pH 7.6); abrupt smooth boundary. (0 to 9 inches thick)

2Crl--27 to 44 inches; brownish yellow (10YR 6/6) weathered tuff bedrock that retains primary rock structure and textures to a clay; disseminated lime; common thin clay films lining pores and on faces of peds; few very fine and fine roots; few fine tubular pores; abrupt smooth boundary.

2Cr2--44 to 60 inches; reddish yellow (7.5YR 6/8) weathered tuff bedrock that retains primary rock structure and textures to a clay; disseminated lime.

**Type location:** Elko County, Nevada; approximately 14 miles southeast of Tuscarora; about 2,250 feet south and 1,100 feet east of the northwest corner of section 3, T. 38 N., R. 53 E.; 41 degrees, 12 minutes, 48 seconds north latitude, 116 degrees, 00 minutes, 13 seconds west longitude.

#### Range in Characteristics

**Soil moisture:** Usually dry; moist late fall through spring, dry late June through October

**Soil temperature:** 45 to 47 degrees F.

**Mollic epipedon thickness:** 10 to 17 inches, includes the upper argillic horizon.

**Depth to paralithic contact:** 20 to 40 inches.

**Reaction:** Neutral to mildly alkaline increasing with depth.

#### Control section:

Clay content--35 to 50 percent.

Rock fragments--15 to 35 percent, mainly cobbles and pebbles.

#### A horizons:

Value--5 or 6 dry, 2 or 3 moist.

Chroma--2 or 3.

#### Bt1 horizon:

Chroma--2 or 3.

Texture--Clay loam or gravelly clay loam.

Clay content--30 to 40 percent

Rock fragments--10 to 35 percent average, mainly pebbles.

Structure--Weak or moderate subangular blocky, or is platy.

#### Bt2 and Bt3 horizons:

Chroma--3 or 4 moist.

Clay content--40 to 55 percent.

Texture--Clay, gravelly clay or cobbly clay.



Rock fragments--10 to 20 percent pebbles, 0 to 5 percent stones and 5 to 15 percent cobbles.

Structure--Subangular or angular blocky in the upper subhorizon, weak to strong, fine to coarse prismatic in the lower subhorizons.

**Cr horizons:**

Effervescence--Noneffervescence to slightly effervescent.

## Linkup Series

The Linkup series consists of shallow, well drained soils that formed in residuum and colluvium from basalt, andesite, rhyolite and tuff. Linkup soils are on summits or crests and side slopes of plateaus, hills and mountains. Slopes are 2 to 50 percent. Mean annual precipitation is about 11 inches and the mean annual temperature is about 44 degrees F.

**Taxonomic class:** Clayey, montmorillonitic, frigid Lithic Xerollic Haplargids

**Typical pedon:** Linkup gravelly clay loam, 4 to 15 percent slopes, located in an area of map unit 1675. (Colors are for dry soils unless otherwise noted.) The surface is partially covered with 15 percent pebbles and 5 percent cobbles.

A1--0 to 3 inches; light brownish gray (10YR 6/2) gravelly clay loam, dark grayish brown (10YR 4/2) moist; moderate thin platy structure; slightly hard, friable, slightly sticky and slightly plastic; common fine and very fine roots; few medium, many fine and very fine vesicular pores; 5 percent cobbles, 15 percent pebbles; neutral (pH 6.6); abrupt smooth boundary. (3 to 4 inches thick)

A2--3 to 5 inches; brown (10YR 5/3) clay loam, dark brown (10YR 4/3) moist; weak fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common medium, many fine and very fine roots; few fine and very fine vesicular and interstitial pores; 5 percent pebbles; neutral (pH 7.2); abrupt smooth boundary. (0 to 4 inches thick)

Bt1--5 to 9 inches; dark brown (7.5YR 4/4) gravelly clay, dark brown (7.5YR 4/4) moist; moderate fine and medium subangular blocky structure; hard, firm, sticky and plastic; common medium and fine roots; common fine and very fine interstitial pores; many moderately thick clay films on faces of ped and lining pores; 5 percent cobbles, 10 percent pebbles; neutral (pH 7.2); abrupt wavy boundary. (4 to 7 inches thick)

Bt2--9 to 17 inches; dark brown (7.5YR 4/4) clay, dark brown (7.5YR 4/4) moist; moderate medium and coarse prismatic structure parting to coarse and medium angular blocky; very hard, firm, sticky and plastic; few medium and fine roots; few very fine interstitial pores; continuous thick clay films on

faces of peds and lining pores, 5 percent cobbles, 5 percent pebbles; neutral (pH 7.2); abrupt wavy boundary. (5 to 8 inches thick)

R--17 inches; rhyolite.

**Type location:** Elko County, Nevada; approximately 9 miles west of Midas; in an unsectionized area, about 1,800 feet north and 1,900 feet west of the southeast corner of the estimated section 2, T. 46 N., R. 46 E.; 41 degrees, 55 minutes, 10 seconds north latitude, 116 degrees, 47 minutes, 40 seconds west longitude.

### Range in Characteristics

*Soil moisture:* Usually dry; moist in the winter and spring, dry mid-June through early November

*Soil temperature:* 45 to 47 degrees F.

*Soil thickness and depth to bedrock:* 14 to 20 inches.

*Sand content:* 20 to 45 percent.

*Reaction:* Slightly acid through mildly alkaline, usually increasing with depth.

*Control section:*

Clay content--35 to 50 percent.

Rock fragments--10 to 35 percent, mainly pebbles and cobbles.

**A horizons:**

Value--3 or 4 moist.

Chroma--2 or 3.

**Bt horizons:**

Hue--7.5YR or 10YR.

Value--4 through 6 dry, 3 through 5 moist.

Chroma--3 through 6.

Texture--Gravelly clay, clay loam, gravelly clay loam or cobbly clay loam with very cobbly clay loam common in some pedons in the upper part. Clay, gravelly clay or cobbly clay in the lower part.

Clay content--27 to 45 percent in the upper part, 40 to 55 percent in the lower part.

Structure--Fine through coarse prismatic subangular blocky, or angular blocky.

Consistence--Hard or very hard dry.

Other features--The lower Bt subhorizons of some pedons have lime coats on rock fragments.

## Loncan Series

The Loncan series consists of moderately deep, well drained soils that formed in residuum and colluvium derived mainly from chert or sedimentary and volcanic rock sources. Loncan soils are on side slopes of hills and mountains. Slopes are 4 to 75 percent. The mean annual precipitation is about 14 inches and the mean annual air temperature is 42 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, frigid Aridic Haploxerolls

**Typical pedon:** Loncan very gravelly loam, 15 to 50 percent slopes, located in an area of map unit 586. (Colors are for dry soil unless otherwise noted.)

A1--0 to 3 inches; grayish brown (10YR 5/2) very gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate medium platy structure; slightly hard, firm, slightly sticky and nonplastic; common fine and very fine roots; many medium vesicular and common fine tubular pores; 35 percent pebbles, mildly alkaline (pH 7.4); clear smooth boundary. (1 to 5 inches thick)

A2--3 to 7 inches; brown (10YR 5/3) very gravelly loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine roots; common fine and very fine tubular pores; 55 percent pebbles; mildly alkaline (pH 7.4); clear smooth boundary. (3 to 7 inches thick)

A3--7 to 17 inches; brown (10YR 5/3) very gravelly loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine roots; common very fine tubular pores; 55 percent pebbles; neutral (pH 7.2); clear smooth boundary. (3 to 12 inches thick)

C--17 to 30 inches; yellowish brown (10YR 5/4) very gravelly sandy clay loam, dark yellowish brown (10YR 3/4) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine and fine tubular pores; 55 percent pebbles; mildly alkaline (pH 7.6); clear smooth boundary. (10 to 22 inches thick)

R--30 inches; hard fractured chert.

**Type location:** Elko County, Nevada; approximately 35 miles north of Elko; about 1,830 feet south and 1,420 feet west of the northeast corner of section 28, T. 39 N., R. 53 E.; 41 degrees, 14 minutes, 37 seconds north latitude, 116 degrees, 00 minutes, 32 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Usually dry; moist in winter and spring, dry late June through mid-October

*Soil temperature:* 42 to 47 degrees F.

*Mollic epipedon thickness:* 10 to 17 inches.

*Depth to bedrock:* 21 to 38 inches.

*Other features:* Some pedons have AC horizons.

*Control section:*

Clay content--18 to 27 percent.

Rock fragments--Averages 50 to 70 percent pebbles and cobbles with very few stones.

**A horizons:**

Value--4 or 5 dry.

Chroma--2 or 3.

**C horizon:**

Value--5 or 6 dry, 3 or 4 moist.

Chroma--2 through 4.

Texture--Very gravelly loam, extremely cobbly loam, very gravelly sandy clay loam or extremely gravelly loam.

Rock fragments--40 to 70 percent pebbles and cobbles.

## Lynnbow Series

The Lynnbow series consists of deep, well drained soils that formed in thin loess over mixed alluvium and residuum from tuff. The Lynnbow soils are on hills and fan piedmont remnants with a rock core. Slopes are 2 to 8 percent. The mean annual precipitation is about 14 inches and the mean annual temperature is about 43 degrees F.

**Taxonomic class:** Fine, montmorillonitic, frigid Typic Palexerolls

**Typical pedon:** Lynnbow silt loam, 2 to 8 percent slopes, located in an area of map unit 200. (Colors are for dry soil unless otherwise noted.) The soil surface is partially covered with 5 percent pebbles.

A--0 to 4 inches; grayish brown (10YR 5/2) silt loam, very dark grayish brown (10YR 3/2) moist; weak medium platy structure; slightly hard, very friable, sticky and plastic; many very fine roots; many very fine tubular pores; neutral (pH 7.2); abrupt smooth boundary. (3 to 7 inches thick)

Bt1--4 to 8 inches; very dark grayish brown (10YR 3/2) silty clay, very dark brown (10YR 2/2) moist; moderate fine subangular blocky structure; slightly hard, friable, very sticky and very plastic; common very fine and fine roots; many very fine tubular pores; common thin clay films lining pores, on faces of peds and bridging sand grains; common clean sand grains throughout; 10 percent pebbles; neutral (pH 7.0); clear wavy boundary. (3 to 6 inches thick)

Bt2--8 to 15 inches; very dark grayish brown (10YR 3/2) silty clay, very dark brown (10YR 2/2) moist; strong medium subangular blocky structure; hard, firm, very sticky and very plastic; common very fine and fine roots; many very fine tubular pores; common thin clay films on faces of peds and bridging sand grains; faces of peds coated with clean sand grains; many clean sand grains in peds; 10 percent pebbles; neutral (pH 7.0); abrupt wavy boundary. (6 to 9 inches thick)

2Bt3--15 to 18 inches; dark brown (7.5YR 3/2) silty clay, dark brown (7.5YR 3/2) moist; strong medium prismatic structure; very hard, very firm, very sticky



and very plastic; common very fine expd roots; few very fine tubular pores; continuous stress surfaces on faces of peds; top of prisms coated with clean sand grains; 5 percent pebbles; neutral (pH 7.2); abrupt wavy boundary. (2 to 4 inches thick)

2Bt4--18 to 26 inches; brown (7.5YR 4/4) silty clay, brown (7.5YR 4/4) moist; strong medium prismatic structure; very hard, very firm, very sticky and very plastic; few very fine expd roots; few very fine tubular pores; continuous stress surfaces on faces of peds; 5 percent pebbles; mildly alkaline (pH 7.4); clear wavy boundary. (6 to 10 inches thick)

2Btqk1--26 to 33 inches; yellowish brown (10YR 5/4) silty clay, dark yellowish brown (10YR 3/4) moist; moderate medium prismatic structure parting to strong medium and coarse angular blocky; hard, firm, very sticky and very plastic; few very fine roots; common very fine tubular pores; common strong brown (7.5YR 5/6) dry clay films and silica coats on faces of peds; 10 percent pebbles; common medium soft masses of lime; moderately alkaline (pH 8.0); clear wavy boundary. (5 to 12 inches thick)

2Btqk2--33 to 40 inches; yellowish brown (10YR 5/4) silty clay, dark yellowish brown (10YR 3/4) moist; moderate medium angular blocky structure; hard, friable, very sticky and very plastic; few very fine roots; common very fine tubular pores; common strong brown (7.5YR 5/6) dry clay films and silica coats on faces of peds; 15 percent pebbles; common medium filaments, threads and soft masses of lime; slightly effervescent; moderately alkaline (pH 8.0); clear wavy boundary. (6 to 9 inches thick)

3Bqk--40 to 58 inches; brown (10YR 5/3) loam, dark yellowish brown (10YR 3/4) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; common very fine tubular pores; weak continuous silica cementation; 10 percent pebbles; many medium filaments and threads of lime; slightly effervescent; moderately alkaline (pH 8.2); clear smooth boundary. (5 to 20 inches thick)

Cr--58 inches; soft tuff.

**Type location:** Elko County, Nevada; approximately 4 miles east of Wilson Reservoir; about 1,000 feet west and 700 feet north of the southeast corner of section 22, T. 44 N., R. 51 E.; 41 degrees, 41 minutes, 35 seconds north latitude, 116 degrees, 13 minutes, 30 seconds west longitude.

#### Range in Characteristics

**Soil moisture:** Moist in winter and spring, dry from mid July through October

**Soil temperature:** 44 to 47 degrees F.

**Mollic epipedon thickness:** 14 to 19 inches.

**Depth to paralithic:** 45 to 60 inches.

**Depth to carbonates and silica coats:** 20 to 30 inches.

#### Control section:

Clay content--50 to 60 percent.

Texture--Silt clay or clay.

Rock fragments--0 to 15 percent.

#### A horizon:

Value--2 or 3 moist.

Chroma--2 or 3.

#### Bt horizons:

Hue--10YR or 7.5YR.

Value--3 through 5 dry, 2 through 4 moist.

Chroma--2 or 3.

Texture--Silty clay or clay.

Clay content--45 to 65 percent in any one subhorizon and averages 50 to 60 percent.

Rock fragments--0 to 15 percent.

Structure--Subangular blocky, angular blocky or prismatic.

Reaction--Neutral or mildly alkaline.

#### Btqk horizons:

Hue--10YR or 7.5YR.

Value--4 or 5 dry.

Chroma--3 or 4.

Texture--Silty clay or clay.

Clay content--40 to 55 percent.

Rock fragments--0 to 15 percent.

Structure--Angular blocky or prismatic.

Silica coats--Common or many on ped surfaces.

Secondary carbonates--Common or many segregated soft masses, filaments or threads.

## Mahala Series

The Mahala series consists of moderately deep, well drained soils that formed in a thin loess mantle over residuum from tuff. Mahala soils are on hills. Slopes are 4 to 15 percent. The mean annual temperature is about 47 degrees F. and the mean annual precipitation is about 11 inches.

**Taxonomic class:** Fine, montmorillonitic, mesic Xerollic Paleargids

**Typical pedon:** Mahala silt loam, 4 to 15 percent slopes, located in an area of map unit 1910. (Colors are for dry soil unless otherwise noted.)

A--0 to 4 inches; light gray (10YR 7/2) silt loam, dark grayish brown (10YR 4/2) moist; moderate medium platy structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine roots; many very fine and fine vesicular pores; 5 percent, 2 to 5 millimeter pebbles; neutral (pH 7.2); abrupt smooth boundary. (1 to 4 inches thick)

E--4 to 5 inches thick; light brownish gray (10YR 6/2) silt loam, dark brown (10YR 3/3) moist with light gray (10YR 7/2) bleached sand grains and common

fine distinct dark brown (7.5YR 3/4) iron mottles; weak medium prismatic structure; hard, friable, sticky and slightly plastic; common very fine, fine and few medium roots; many very fine and few fine tubular pores; neutral (pH 7.2); abrupt smooth boundary. (0 to 1 inches thick)

2Bt1--5 to 9 inches; brown (10YR 5/3) clay, dark brown (10YR 4/3) moist with light gray (10YR 7/2) bleached sand grains capping prisms, strong medium prismatic structure parting to strong coarse angular blocky, very hard, firm, very sticky and very plastic; common very fine roots; many very fine tubular pores; many stress surfaces on faces of peds; mildly alkaline (pH 7.4); clear smooth boundary. (4 to 13 inches thick)

2Bt2--9 to 14 inches; light yellowish brown (10YR 6/4) clay, yellowish brown (10YR 5/4) moist; weak medium prismatic structure parting to moderate coarse angular blocky; very hard, firm, very sticky and very plastic; common very fine roots; many very fine tubular pores; common stress surfaces on faces of peds and common moderately thick clay films on faces of peds; moderately alkaline (pH 8.0); clear wavy boundary. (5 to 12 inches thick)

2Btk--14 to 26 inches; light yellowish brown (10YR 6/4) clay, yellowish brown (10YR 5/4) moist; moderate medium subangular blocky structure parting to moderate fine subangular blocky; very hard, firm, very sticky and plastic; few very fine roots; many very fine tubular pores; many thin clay films coating sand grains and on faces of peds; lime is disseminated; slightly effervescent; moderately alkaline (pH 8.4); clear wavy boundary. (7 to 20 inches thick)

Cr--26 inches; very pale brown (10YR 7/3) weathered tuff bedrock with few fine discontinuous lime coatings in fractures.

**Type location:** Elko County, Nevada; approximately 10 miles west of Jack Creek; about 2,312 feet north and 100 feet west of the southeast corner of section 19, T. 43 N., R. 51 E.; 41 degrees, 36 minutes, 35 seconds north latitude, 116 degrees, 16 minutes, 50 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Usually dry; moist in winter and spring, dry late June through October

*Soil temperature:* 47 to 50 degrees F.

*Depth to carbonates:* 14 to 30 inches.

*Solum thickness and depth to weathered bedrock:* 20 to 40 inches.

*Reaction:* Neutral through moderately alkaline, normally increasing with depth.

*Control section:*

Clay content--40 to 60 percent average.

Rock fragments--0 to 20 percent mainly pebbles.

#### A horizon:

Value--5 through 7 dry, 3 or 4 moist.

Chroma--1 through 3.

#### E horizon: (when present):

Value--6 or 7 dry.

Other features--Commonly has bleached sand grains and common fine distinct iron mottles.

#### Bt horizons:

Value--5 or 6 dry, 4 to 6 moist.

Chroma--2 through 4 dry, 3 or 4 moist.

Texture--Clay or gravelly clay.

Structure--Weak through strong, medium to coarse prismatic, or columnar weak or moderate fine to coarse subangular or angular blocky or prismatic parting to angular or subangular blocky.

Other features--Bleached sand grains commonly cap prisms.

#### Btk horizon:

Value--6 or 7 dry, 5 or 6 moist.

Chroma--2 to 4.

Texture--Clay or clay loam with gravelly clay loam, or silty clay loam common in some pedons.

Reaction--Mildly or moderately alkaline.

Carbonates--Disseminated but may include filaments or threads in some pedons.

#### Cr horizons:

Other features--Few or common, fine or medium, lime coats or soft masses and threads on fracture planes.

Effervescence--None to slightly, may be strong in areas of visible carbonate accumulation.

## McCleary Series

The McCleary series consists of very deep, very poorly drained soils that formed in alluvium from mixed sources with a thin loess cap. McCleary soils are on small relict lake plains and fan skirts adjacent to lake plains. Slopes are 0 to 2 percent. Mean annual precipitation is about 9 inches and the mean annual temperature is about 47 degrees F.

**Taxonomic class:** Fine, montmorillonitic, nonacid, mesic Aeric Fluvaquents.

**Typical pedon:** McCleary silt loam, located in an area of map unit 2560. (Colors are for dry soil unless otherwise noted.)

Al--0 to 1 inch; light gray (2.5Y 7/2) silt loam, grayish brown (2.5Y 5/2) moist; weak medium platy structure; soft, friable, slightly sticky and slightly plastic; many medium vesicular pores; moderately alkaline (pH 8.0); abrupt smooth boundary. (1 to 2 inches thick)



A2--1 to 4 inches; light gray (10YR 7/2) silt loam, dark grayish brown (10YR 4/2) moist; weak medium platy structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; many medium vesicular pores; moderately alkaline (pH 8.0); abrupt smooth boundary. (2 to 4 inches thick)

2C1--4 to 13 inches; light brownish gray (2.5Y 6/2) clay, dark grayish brown (2.5Y 4/2) moist; few fine distinct yellowish brown (10YR 5/6) iron mottles; strong medium angular blocky structure; very hard, very firm, very sticky and very plastic; few fine roots, few fine tubular pores; moderately alkaline (pH 8.0); clear smooth boundary. (8 to 13 inches thick)

2C2--13 to 22 inches; light brownish gray (2.5Y 6/2) clay, dark grayish brown (2.5Y 4/2) moist; few fine distinct yellowish brown (10YR 5/6) iron mottles; moderate medium subangular blocky structure; very hard, very firm, very sticky and very plastic; few fine roots; few fine tubular pores; few fine manganese concretions; moderately alkaline (pH 8.0); gradual wavy boundary. (8 to 17 inches thick)

2C3--22 to 56 inches; light brownish gray (2.5Y 6/2) clay, dark grayish brown (2.5Y 4/2) moist; few fine distinct dark yellowish brown (10YR 4/4) iron mottles; massive; very hard, very firm, very sticky and very plastic; few fine roots; few fine tubular pores; few fine manganese concretions; moderately alkaline (pH 8.2); gradual wavy boundary. (25 to 35 inches thick)

2C--56 to 60 inches; light brown (7.5YR 6/4) clay, yellowish brown (10YR 5/4) moist; few fine faint brown (7.5YR 5/4) iron mottles; massive; very hard, very firm, very sticky and very plastic; few fine tubular pores; moderately alkaline (pH 8.2).

**Type location:** Elko County, Nevada; Owyhee Desert, in an unsectionized area, about 7 miles west of Desert Ranch Reservoir; 41 degrees, 40 minutes, 31 seconds north latitude, 116 degrees, 40 minutes, 12 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Seasonal high water table between 4 and 20 inches between February and May

*Soil temperature:* 47 to 52 degrees F.

*Other features:* Few to many iron manganese concretions can occur in any horizon.

#### Control section:

Clay content--40 to 50 percent.

Rock fragments--0 to 15 percent.

#### A horizons:

Hue--10YR or 2.5Y.

Value--5 through 7 dry, 3 through 5 moist.

Chroma--2 or 3.

#### C horizons:

Texture--Clay or silty clay.

## Mclvey Series

The Mclvey series consists of very deep, well drained soils that formed mainly in colluvium from tuff, shale, sandstone, conglomerate, andesite, rhyolite, quartzite or welded tuffs. The Mclvey soils are on hills, mountains and high fan piedmont remnants and partial ballenas bordering hills and mountains. Slopes are 2 to 75 percent. The mean annual precipitation is about 14 inches and the mean annual temperature is about 43 degrees F.

**Taxonomic class:** Clayey-skeletal, montmorillonitic, frigid Typic Argixerolls

**Typical pedon:** Mclvey gravelly silt loam, 15 to 30 percent slopes, is located in an area of map unit 1950. The soil surface is covered by 20 percent pebbles and 5 percent cobbles. (Colors are for dry soil unless otherwise noted.)

Al--0 to 4 inches; dark grayish brown (10YR 4/2) gravelly silt loam, very dark brown (10YR 2/2) moist; weak fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine roots; common very fine tubular pores; 20 percent pebbles, 5 percent cobbles; neutral (pH 6.8); abrupt wavy boundary. (2 to 8 inches thick)

A2--4 to 16 inches; grayish brown (10YR 5/2) gravelly silt loam, very dark brown (10YR 2/2) moist; strong fine subangular blocky structure; slightly hard, very friable, sticky and plastic; many very fine and common fine roots; many very fine and few fine tubular pores; 15 percent pebbles, 5 percent cobbles; neutral (pH 6.8); clear wavy boundary. (5 to 12 inches thick)

Bt1--16 to 29 inches; yellowish brown (10YR 5/4) very gravelly clay loam, dark yellowish brown (10YR 3/4) moist; moderate medium subangular blocky structure; hard, friable, sticky and plastic; common very fine roots; many very fine and common fine tubular pores; 30 percent pebbles, 10 percent cobbles; few thin clay films lining pores; neutral (pH 6.8); clear wavy boundary. (3 to 13 inches thick)

2Bt2--29 to 44 inches; yellowish brown (10YR 5/4) very cobbly clay, dark yellowish brown (10YR 4/4) moist; moderate medium angular blocky structure; hard, friable, sticky and plastic; few very fine roots; many very fine and common fine tubular pores; 30 percent pebbles, 20 percent cobbles; many moderately thick clay films on faces of peds and lining pores; neutral (pH 6.8); clear wavy boundary (5 to 18 inches thick)

2Bt3--44 to 58 inches; yellowish brown (10YR 5/4) very cobbly clay, yellowish brown (10YR 5/4) moist; strong medium angular blocky structure; hard, very firm, very sticky and very plastic; few very fine roots; many very fine and few fine tubular

pores; 30 percent pebbles, 25 percent cobbles; many moderately thick clay films on faces of peds and lining pores; (pH 6.8); clear wavy boundary. (11 to 16 inches thick)

3C--58 to 65 inches; yellowish brown (10YR 5/4) extremely stony sandy clay loam, yellowish brown (10YR 5/4) moist; massive; hard, very firm, sticky and plastic; few very fine roots; common very fine tubular pores; 25 percent stones, 5 percent boulders; many distinct clay films lining pores; neutral (pH 7.0).

**Type location:** Elko County, Nevada; approximately 1 mile north of Bull Run Reservoir; about 1,600 feet west and 1,600 feet north of the southeast corner of section 3, T. 43 N., R. 52 E.; 41 degrees, 39 minutes, 5 seconds north latitude, 116 degrees, 06 minutes, 40 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Moist in the winter and spring, dry mid July through October

*Soil temperature:* 42 to 47 degrees F.

*Mollic epipedon thickness:* 12 to 20 inches, does not include the argillic horizon.

#### *Control section:*

Clay content--35 to 50 percent.

Rock fragments--Averages 35 to 60 percent, mainly pebbles and cobbles.

#### **A horizons:**

Value--4 or 5 dry, 2 or 3 moist.

Chroma--1 to 3.

#### **Bt1 horizon:**

Hue--7.5YR or 10YR.

Value--3 or 4 moist.

Chroma--3 or 4.

Texture--Very gravelly clay loam or gravelly clay loam.

Consistence--Hard or very hard, friable to very firm moist.

Clay content--30 to 40 percent.

Rock fragments--15 to 40 percent pebbles, 0 to 10 percent cobbles.

Reaction--Slightly acid to mildly alkaline.

Other features--Moist and dry colors of this horizon do not meet the requirements of a mollic epipedon.

#### **Lower Bt horizons:**

Hue--7.5YR or 10YR.

Value--5 or 6 dry, 4 or 5 moist.

Chroma--3 through 6.

Texture--Very gravelly clay, very cobbly clay or extremely cobbly clay with extremely cobbly clay loam or very gravelly clay loam common in some subhorizons below 40 inches.

Clay content--Commonly 40 to 50 percent, but some pedons have lower subhorizons with 30 to 40 percent.

Rock fragments--35 to 50 percent pebbles, 5 to 25 percent cobbles, 0 to 15 percent stones.

Structure--Subangular blocky, angular blocky or prismatic throughout the profile but is commonly massive in the lower subhorizons.

Consistence--Hard or very hard, firm or very firm moist.

Reaction--Slightly acid through mildly alkaline.

## Midraw Series

The Midraw series consists of shallow over an indurated duripan, well drained soils that formed in residuum from rhyolite. Midraw soils are on plateaus and hills. Slopes are 2 to 15 percent. Mean annual precipitation is about 9 inches and the mean annual temperature is about 47 degrees F.

**Taxonomic class:** Clayey, montmorillonitic, mesic, shallow Xerollic Durargids

**Typical pedon:** Midraw gravelly loam, 8 to 15 percent slopes, located in an area of map unit 3510. (Colors are for dry soil unless otherwise noted.) The soil surface is covered with 10 percent pebbles and 5 percent cobbles.

A--0 to 2 inches; pale brown (10YR 6/3) gravelly loam, dark brown (10YR 3/3) moist; moderate thick platy structure; soft, friable, slightly sticky and slightly plastic; few very fine roots; common very fine vesicular pores; 15 percent pebbles, 5 percent cobbles; neutral (pH 6.6); abrupt smooth boundary. (2 to 6 inches thick)

Bt1--2 to 6 inches; pale brown (10YR 6/3) gravelly clay loam, brown (10YR 4/3) moist; weak medium subangular blocky structure parting to moderate very fine subangular blocky; slightly hard, firm, sticky and plastic; few very fine roots; few very fine tubular pores; few thin clay films lining pores; 15 percent pebbles; neutral (pH 6.6); clear smooth boundary. (2 to 5 inches thick)

Bt2--6 to 13 inches; light yellowish brown (10YR 6/4) gravelly clay, dark yellowish brown (10YR 4/4) moist; weak medium prismatic structure parting to strong fine angular blocky; very hard, very firm, very sticky and very plastic; few fine and very fine roots; few fine tubular pores; many moderately thick clay films on peds and lining pores; 10 percent pebbles, 5 percent cobbles; neutral (pH 7.2); gradual smooth boundary. (3 to 7 inches thick)

Bt3--13 to 17 inches; light yellowish brown (10YR 6/4) gravelly clay, dark yellowish brown (10YR 4/4) moist; strong fine angular blocky structure; very hard, very firm, very sticky and very plastic; few very fine roots; few fine tubular pores; many



moderately thick clay films on peds and lining pores; 10 percent pebbles; 5 percent cobbles; slightly effervescent; neutral (pH 7.2); gradual smooth boundary. (0 to 5 inches thick)

Bqk--17 to 19 inches; very pale brown (10YR 7/3) very gravelly clay loam, yellowish brown (10YR 5/4) moist; massive; hard, firm, sticky and plastic; 50 percent gravel size duripan fragments; violently effervescent, lime is disseminated; moderately alkaline (pH 8.0); clear smooth boundary (0 to 5 inches thick)

Bqkm--19 to 25 inches; very pale brown (10YR 7/3) indurated duripan; massive, extremely hard, extremely firm; silica laminae are 1/2 to 2 millimeter thick; duripan composed of thin to thick alternating weakly cemented and indurated layers; abrupt smooth boundary. (4 to 15 inches thick)

R--25 inches; rhyolite.

**Type location:** Elko County, Nevada; Owyhee Desert, in an unsectionized area, about 27 miles northwest of Wilson Reservoir; approximately 1,400 feet west of the apparent northeast corner of section 4, T. 46 N., R. 47 E.; 41 degrees, 55 minutes, 22 seconds north latitude, 116 degrees, 42 minutes, 50 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Usually dry; moist in winter and spring, dry in late June through October

*Soil temperature:* 47 to 52 degrees F.

*Depth to base of Bt horizons:* 14 to 20 inches.

*Depth to duripan:* 14 to 20 inches.

*Depth to bedrock:* 20 to 35 inches.

*Control section:*

Clay content--35 to 45 percent.

Rock fragments--15 to 35 percent.

#### A horizon:

Value--6 or 7 dry, 3 through 5 moist.

Chroma--2 or 3.

Reaction--Neutral to moderately alkaline.

#### Bt horizon:

Value--5 or 6 dry, 3 through 5 moist.

Chroma--2 through 4.

Texture--Gravelly clay loam, gravelly silty clay loam, gravelly clay or cobbly clay.

Consistence--Friable, firm or very firm, moist.

Structure--Prismatic, subangular blocky or angular blocky.

Rock fragments--15 to 35 percent.

Reaction--Neutral to moderately alkaline.

Other features--Some pedons have durinodes or pan fragments in the lower subhorizon.

#### Bqk horizon:

Hue--7.5YR or 10YR.

Value--6 or 7 dry, 3 or 4 moist

Chroma--3 or 4 .

Structure--Subangular blocky or is massive

Consistence--Friable or firm, moist; slightly plastic or plastic, wet.

#### Bqkm horizon:

Hue--7.5YR or 10YR.

Value--5 through 7 dry, 4 or 5 moist.

Chroma--3 or 4.

## Ninemile Series

The Ninemile series consists of shallow, well drained soils that formed in residuum from andesite, rhyolite, basalt and welded tuff. The Ninemile soils are on hills and mountains. Slopes are 4 to 50 percent. The mean annual precipitation is about 14 inches and the mean annual temperature is about 44 degrees F.

**Taxonomic class:** Clayey, montmorillonitic, frigid Lithic Argixerolls

**Typical pedon:** Ninemile cobbly loam, 4 to 15 percent slopes, located in an area of map unit 1653. (Colors are for dry soil unless otherwise noted.) The soil surface is covered with 10 percent pebbles and 20 percent cobbles.

A1--0 to 2 inches; grayish brown (10YR 5/2) cobbly loam, very dark grayish brown (10YR 3/2) moist; weak thin platy structure; slightly hard, friable, slightly sticky and slightly plastic; common medium, fine and very fine roots; common medium and fine vesicular pores; 10 percent pebbles, 20 percent cobbles; neutral (pH 7.2); abrupt smooth boundary. (1 to 7 inches thick)

A2--2 to 4 inches; grayish brown (10YR 5/2) gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate thin platy parting to strong fine granular structure; slightly hard, friable, slightly sticky and slightly plastic; common medium and fine tubular pores; 10 percent pebbles, 5 percent cobbles; neutral (pH 7.2); abrupt wavy boundary. (0 to 4 inches thick)

Bt1--4 to 9 inches; brown (10YR 5/3) clay, dark brown (10YR 3/3) moist; strong fine subangular blocky structure; very hard, firm, sticky and plastic; few medium fine and very fine roots; few fine and very fine tubular pores; many moderately thick clay films on faces of peds and lining pores; 5 percent pebbles, 5 percent cobbles; neutral (pH 7.2); abrupt wavy boundary. (0 to 5 inches thick)

Bt2--9 to 14 inches; brown (10YR 5/3) clay, dark brown (10YR 4/3) moist; strong coarse prismatic structure; very hard, very firm, very sticky and very plastic; few medium, fine and very fine roots; few fine and very fine pores; continuous stress surfaces on faces of peds; 5 percent pebbles, 5 percent

cobbles; mildly alkaline (pH 7.4); abrupt wavy boundary. (3 to 9 inches thick)

Bt3--14 to 19 inches; light yellowish brown (10YR 6/4) gravelly clay, dark yellowish brown (10YR 4/4) moist; massive; very hard, very firm, very sticky and very plastic; 20 percent pebbles; 5 percent cobbles, many moderately thick clay films coating coarse fragments; mildly alkaline (pH 7.4); abrupt wavy boundary. (4 to 7 inches thick)

R--19 inches; rhyolite.

**Type location:** Elko County, Nevada; Owyhee Desert, in an unsectionized area, about 8 miles north of Midas; 41 degrees, 20 minutes, 40 seconds north latitude, 116 degrees, 51 minutes, 08 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Usually dry; moist during the winter and spring, dry mainly during late June through early October

*Soil temperature:* 44 to 47 degrees F.

*Depth to bedrock:* 10 to 20 inches.

*Mollic epipedon:* 6 to 18 inches; commonly includes part or all of the argillic horizon. (Mixed to 7 inches will be mollic)

#### Control section:

Clay content--Averages 40 to 60 percent.

Rock fragments--0 to 35 percent

#### A horizons:

Hue--10YR or 7.5YR

Value--3 through 5 dry, 2 or 3 moist.

Chroma--1 through 3.

Reaction--Slightly acid through moderately alkaline.

Other features--Surface 1 or 2 inches of some pedons have color value of 6 and are massive.

#### Bt horizons:

Hue--5YR, 7.5YR or 10YR.

Value--3 through 6 dry, 2 through 4 moist.

Chroma--2 through 4, lower subhorizons have chroma of 6 in some pedons.

Clay content--Typically 40 to 60 percent. Some subhorizons range to 35 percent.

Texture--Mainly clay or gravelly clay, but some subhorizons range to clay loam.

Rock fragments--0 to 30 percent pebbles or cobbles.

Structure--Moderate or strong subangular or angular blocky or prismatic. Bt3 horizons may be massive in some pedons

Reaction--Neutral through moderately alkaline.

Other features--Some pedons are slightly hard dry, sticky and plastic wet in the Bt1 horizon.

#### R horizons:

Other features--In some pedons, where bedrock is less than 15 inches deep, the upper 1 to 3 inches of bedrock is weathered.

### Olac Series

The Olac series consists of shallow, well drained soils that formed in residuum weathered from andesite and related rocks. The Olac soils are on hills and mountains. Slopes are 4 to 75 percent. Mean annual precipitation is about 9 inches, and mean annual temperature is about 48 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic Lithic Xerollic Haplargids

**Typical pedon:** Olac very stony loam, 4 to 15 percent slopes, located in an area of map unit 2641. (Colors are for dry soil unless otherwise noted.) The soil surface is covered with 15 percent pebbles, 20 percent cobbles and 10 percent stones.

A1--0 to 2 inches; pale brown (10YR 6/3) very stony loam, dark brown (10YR 3/3) moist; moderate medium platy structure; slightly hard, friable, slightly sticky and slightly plastic; few fine roots; many fine vesicular pores; 15 percent pebbles; 20 percent cobbles, 10 percent stones; neutral (pH 7.2); abrupt smooth boundary. (1 to 3 inches thick)

A2--2 to 4 inches; pale brown (10YR 6/3) very stony loam, dark brown (10YR 4/3) moist; moderate thin platy structure; slightly hard, friable, slightly sticky and plastic; few very fine roots; many fine vesicular pores; 5 percent pebbles, 20 percent cobbles, 15 percent stones; mildly alkaline (pH 7.6); clear smooth boundary. (1 to 3 inches thick)

Bt1--4 to 9 inches; pale brown (10YR 6/3) extremely gravelly clay loam, dark brown (10YR 4/3) moist, moderate fine subangular blocky structure; hard, firm, sticky and plastic; few fine and very fine roots; few fine tubular pores; common moderately thick clay films on faces of peds; 45 percent pebbles, 15 percent cobbles; mildly alkaline (pH 7.6); clear wavy boundary. (4 to 5 inches thick)

Bt2--9 to 14 inches; brown (7.5YR 5/4) extremely gravelly clay loam, dark, brown (7.5YR 4/4) moist; strong fine subangular blocky structure; hard, firm, sticky and plastic; few fine roots; many thick clay films on faces of peds; 45 percent pebbles, 15 percent cobbles; mildly alkaline (pH 7.4); abrupt smooth boundary. (1 to 5 inches thick)

R--14 inches; consolidated basalt.

**Type location:** Elko, Nevada; Owyhee Desert, in an unsectionized area, about 20 miles northeast of Midas; 41 degrees, 36 minutes, 35 seconds north latitude, 116 degrees, 59 minutes, 37 seconds west longitude.



### Range in Characteristics

*Soil moisture:* Usually dry summer and fall, moist November through early June

*Soil temperature:* 47 to 52 degrees F.

*Depth to bedrock:* 8 to 14 inches.

*Reaction:* Slightly acid through mildly alkaline.

*Control section:*

Clay content--18 to 27 percent.

Rock fragments--35 to 60 percent, mainly angular pebbles with 0 to 30 percent cobbles or stones in the upper part.

#### A horizons:

Value--5 or 6 dry, 3 or 4 moist.

Chroma--2 or 3.

Rock fragments--20 to 65 percent.

#### Bt horizons:

Hue--10YR or 7.5YR.

Value--4 through 7 dry, 3 or 4 moist.

Chroma--2 through 4.

Texture--Extremely gravelly loam or extremely gravelly clay loam.

Clay content--23 to 30 percent.

Rock fragments--60 to 75 percent, mainly pebbles.

## Old Camp Series

The Old Camp series consists of shallow, well drained soils that formed in residuum and colluvium weathered from tuff, basalt, rhyolite and andesite with a minor component of volcanic ash. Old Camp soils are on hills, mountains, and plateaus. Slopes are 2 to 75 percent. The mean annual precipitation is about 10 inches and the mean annual temperature is about 47 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic Lithic Xerollic Haplargids

**Typical pedon:** Old Camp extremely stony loam, 15 to 30 percent slopes, located in an area of map unit 2790. (Colors are for dry soil unless otherwise noted.) The soil surface is covered with 10 percent pebbles, 30 percent cobbles and 10 percent stones. A1--0 to 3 inches; pale brown (10YR 6/3) very stony loam, dark brown (10YR 3/3) moist; weak medium platy structure; soft, friable, slightly sticky and slightly plastic; few fine and very fine roots; few fine tubular pores; 10 percent pebbles, 25 percent cobbles, 10 percent stones; neutral (pH 7.0); abrupt smooth boundary. (1 to 4 inches thick) A2--3 to 6 inches; pale brown (10YR 6/3) very cobbly loam, dark brown (10YR 4/3) moist; massive; soft, friable, slightly sticky and slightly plastic; few very fine roots; few very fine pores; 20 percent pebbles,

20 percent cobbles; mildly alkaline (pH 7.4); clear smooth boundary. (0 to 3 inches thick)

Bt--6 to 16 inches; pale brown (10YR 6/3) very cobbly clay loam, dark yellowish brown (10YR 4/4) moist; moderate fine subangular blocky structure; hard, firm, sticky and plastic; few very fine roots; common moderately thick clay films on faces of peds; few thin lime and silica coatings on undersides of rock fragments next to the bedrock; 25 percent pebbles, 25 percent cobbles; mildly alkaline (pH 7.4); clear wavy boundary. (6 to 13 inches thick)

R--16 inches; consolidated rhyolite; many fine and very fine matted roots on bedrock.

**Type location:** Elko County, Nevada; in an unsectionized area, about 20 miles northwest of Midas; 41 degrees, 29 minutes, 2 seconds north latitude, 116 degrees, 58 minutes, 44 seconds west longitude.

### Range in Characteristics

*Soil moisture:* Usually dry; moist November through May

*Soil temperature:* 47 to 52 degrees F.

*Depth to bedrock:* 10 to 20 inches.

*Control section:*

Rock fragments--50 to 75 percent, dominantly cobbles and stones. The upper part has 35 to 50 percent rock fragments in some pedons.

#### A horizons:

Value--5 through 7 dry, 3 or 4 moist.

Chroma--2 or 3.

Reaction--Neutral or mildly alkaline.

#### Bt horizon:

Hue--10YR to 7.5YR

Value--4 through 7 dry, 3 through 5 moist.

Chroma--2 through 4.

Texture--Clay loam or sandy clay loam, with subhorizons in some pedons of loam, modified by average of 50 to 75 percent rock fragments, mainly cobbles and stones.

Clay content--27 to 35 percent.

Structure--Weak or moderate, coarse to fine angular or subangular blocky or massive.

Reaction--Neutral or mildly alkaline in the upper part, neutral to strongly alkaline in the lower part.

Other features--Few to continuous lime coats on rock fragments or bedrock.

## Orovada Series

The Orovada series consists of very deep, well drained soils that formed in loess high in volcanic ash over alluvium from mixed rock sources. The Orovada soils are on fan skirts, fan aprons, inset fans, partial

ballenas, hills and footslopes. Slopes are 0 to 30 percent. The mean annual precipitation is about 8 inches and the mean annual temperature is about 47 degrees F.

**Taxonomic class:** Coarse-loamy, mixed, mesic Durixerollic Camborthids

**Typical pedon:** Orovada very fine sandy loam, 0 to 2 percent slopes, is located in an area of map unit 1363. (Colors are for dry soils unless otherwise noted.)

A1--0 to 2 inches; pale brown (10YR 6/3) very fine sandy loam, dark grayish brown (10YR 4/2) moist; moderate thin platy structure; soft, very friable, nonsticky and nonplastic; common very fine and few fine, medium and coarse roots; many very fine interstitial and vesicular, and few fine tubular pores; mildly alkaline (pH 7.8); clear wavy boundary. (2 to 8 inches thick)

A2--2 to 5 inches; light brownish gray (10YR 6/2) very fine sandy loam, brown (10YR 4/3) moist; moderate thin platy structure; soft, very friable, slightly sticky and slightly plastic; common very fine and few fine, medium and coarse roots; common very fine interstitial and few fine and medium tubular pores; mildly alkaline (pH 7.8); abrupt wavy boundary. (0 to 5 inches thick)

Bw--5 to 19 inches; pale brown (10YR 6/3) loam, brown (10YR 4/3) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; few very fine, medium and coarse roots; common very fine interstitial and few fine and medium tubular pores; moderately alkaline (pH 7.8); clear wavy boundary. (4 to 20 inches thick)

Bq--19 to 29 inches; light gray (2.5Y 7/2) very fine sandy loam, brown (10YR 5/4) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; common very fine and few fine interstitial and tubular pores; 40 percent durinodes; moderately alkaline (pH 8.2); clear wavy boundary. (0 to 12 inches thick)

Bqk1--29 to 39 inches; light yellowish brown (2.5Y 7/2) very fine sandy loam, dark yellowish brown (10YR 4/4) moist; massive; hard, friable, nonsticky and nonplastic; few very fine roots; common very fine interstitial pores; 25 percent durinodes; few thin lime filaments slightly effervescent; moderately alkaline (pH 8.2); clear wavy boundary. (5 to 12 inches thick)

Bqk2--39 to 60 inches; light yellowish brown (10YR 6/4) very fine sandy loam, yellowish brown (10YR 5/4) moist; massive; hard, friable, slightly sticky and nonplastic; few very fine roots; common very fine and few fine interstitial pores; 25 percent durinodes; few thin filaments and soft masses of lime; slightly effervescent; moderately alkaline (pH 8.4).

**Type location:** Elko County, Nevada; approximately 18 miles southwest of Midas; about 850 feet west and 2,400 feet south of the northeast corner of section 11, T. 37 N., R. 44 E.; 41 degrees, 6 minutes, 00 seconds north latitude, 116 degrees, 58 minutes, 20 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Usually dry; moist in winter and spring, dry from late June through early November

*Soil temperature:* 47 to 52 degrees F.

*Depth to Bq or Bqk horizons:* 10 to 28 inches.

*Control section:*

*Other features:* When mixed, value of the upper 7 inches is greater than 5.5 dry and 3.5 moist.

Clay content--5 to 18 percent.

Rock fragments--0 to 15 percent, mainly pebbles.

#### A horizons:

Hue--10YR or 2.5Y.

Value--5 through 7 dry, 3 or 4 moist.

Chroma--2 through 4.

Reaction--Neutral through moderately alkaline.

#### Bw horizon:

Hue--10YR or 2.5Y.

Value--6 through 8 dry; 3 through 6 moist.

Chroma--2 through 6.

Texture--Fine sandy loam, very fine sandy loam, loam, silt loam with strata of loamy fine sand or sandy loam in some pedon.

Clay content--5 to 18 percent.

Rock fragments--Averages 0 to 15 percent pebbles.

Structure--Subangular blocky, prismatic, or horizon is massive.

Reaction--Mildly alkaline or moderately alkaline.

#### Bq and Bqk horizons:

Hue--10YR or 2.5Y.

Value--6 or 7 dry, 3 through 5 moist.

Chroma--2 through 6.

Texture--Fine sandy loam, very fine sandy loam, loam, silt loam with strata of loamy fine sand or sandy loam in some pedon.

Rock fragments--Up to 30 percent pebbles in some subhorizons of some pedons.

Consistence--Soft to hard, dry and very friable or friable, moist, nonsticky or slightly sticky and nonplastic or slightly plastic, wet.

Reaction--Moderately alkaline through very strongly alkaline, increasing with depth.

Cementation--Contains 20 to 80 percent durinodes.

Other features--Gypsum crystals are below depths of 37 inches in some pedons.



## Pattani Series

The Pattani series consists of moderately deep well drained soils that formed in residuum from tuff. The Pattani soils are on hills and rock pediments. Slopes are 4 to 15 percent. The mean annual precipitation is about 11 inches and the mean annual temperature is about 44 degrees F.

**Taxonomic class:** Fine, montmorillonitic, frigid Entic Chromoxererts

**Typical pedon:** Pattani clay, 4 to 15 percent slopes, located in an area of map unit 308. (Colors are for dry soil unless otherwise noted.)

A--0 to 1 inches; reddish brown (5YR 5/3) clay, reddish brown (5YR 5/3) moist; moderate fine subangular blocky structure parting to strong very fine granular; soft, very friable, very sticky, very plastic; few very fine roots; many very fine interstitial pores; 5 percent pebbles; mildly alkaline (pH 7.6); abrupt wavy boundary. (1 to 2 inches thick)

B--1 to 14 inches; reddish brown (5YR 5/3) clay, reddish brown (5YR 4/3) moist; moderate coarse subangular blocky structure; hard, firm, very sticky, very plastic; few very fine and fine roots; many very fine tubular and common very fine interstitial pores; moderately thick stress surfaces coating faces of peds; 5 percent pebbles; moderately alkaline (pH 7.6); clear wavy boundary. (4 to 13 inches thick)

Bk1--14 to 30 inches; reddish brown (5YR 5/3) clay, reddish brown (5YR 4/3) moist; moderate coarse subangular blocky structure; hard, firm, very sticky, very plastic; few very fine and fine roots; many very fine tubular, common very fine interstitial pores; common slickensides; many stress surfaces on faces of peds; 5 percent pebbles; slightly effervescent; moderately alkaline (pH 8.4); clear wavy boundary. (5 to 20 inches thick)

Bk2--30 to 37 inches; light reddish brown (5YR 6/3) clay, light reddish brown (5YR 6/3) moist; weak coarse subangular blocky structure; hard, firm, very sticky, very plastic; few very fine roots; many very fine tubular pores; common slickensides; 5 percent decomposing brownish yellow (10YR 6/6) tuff pebbles; many stress surfaces on faces of peds, disseminated lime with few fine soft masses; strongly effervescent; 5 percent pebbles; moderately alkaline (pH 8.4); clear wavy boundary. (5 to 10 inches thick)

Cr--37 to 40 inches; light gray (2.5Y 7.2) weathered tuff with light reddish brown (5YR 6/3) clay films in fractures; strongly effervescent.

**Type location:** Elko County, Nevada; approximately 6 miles southwest of Willow Creek Reservoir; about 2,500 feet east and 2,400 feet south of the northwest corner of section 13, T. 38 N., R. 47 E.;

41 degrees, 10 minutes, 16 seconds north latitude, 116 degrees, 36 minutes, 48 seconds west longitude.

### Range in Characteristics

*Soil moisture:* Moist winter and spring, dry June through October

*Soil temperature:* 45 to 47 degrees F.

*Depth to paralithic contact:* 20 to 40 inches.

*Depth to lime:* 12 to 20 inches.

*Control section:*

Clay content--35 to 55 percent.

Other features--The soil has cracks that close when the soil becomes moist in late October and opens when the soil becomes dry in early June.

### A horizon:

Hue--10YR, 7.5YR, 5YR or 2.5Y.

Value--5 or 6 moist or dry.

Chroma--2 or 3.

Reaction--Neutral or mildly alkaline.

### B and Bk horizons:

Hue--10YR, 7.5YR, 5YR or 2.5Y.

Value--5 or 6 dry, 4 through 6 moist.

Chroma--2 or 3.

Texture--Clay, silty clay, or clay loam.

Structure--Angular blocky, subangular blocky or it is massive.

Reaction--Moderately alkaline or strongly alkaline.

Other features--Common to many slickensides, has cracks in the dry season that extend to the surface and range up to 2 inches in width.

## Pequop Series

The Pequop series consists of deep, well drained soils that formed in colluvium and residuum from rhyolite, tuff and intrusive igneous rocks. Pequop soils are on side slopes of hills, mountains and fan piedmont remnants with a bedrock core. Slopes are 8 to 50 percent. The mean annual precipitation is about 14 inches and the mean annual temperature is about 43 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, frigid Typic Argixerolls

**Typical pedon:** Pequop gravelly loam, 30 to 50 percent slopes in an area of map unit 1691. (Colors are for dry soil unless otherwise noted.)

Al--0 to 4 inches; dark grayish brown (10YR 4/2) gravelly loam, black (10YR 2/1) moist; moderate fine and medium subangular blocky structure; parting to weak fine granular, soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine and fine tubular pores; 15 percent

pebbles; neutral (pH 6.8); clear smooth boundary. (3 to 8 inches thick)

A2--4 to 12 inches; dark brown (10YR 4/3) gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate fine and medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine, fine, and few medium tubular pores; 25 percent pebbles; neutral (pH 7.0); clear smooth boundary. (7 to 12 inches thick)

Bt1--12 to 19 inches; brown (7.5YR 5/4) extremely gravelly sandy clay loam, dark brown (7.5YR 3/4) moist; weak very fine and fine subangular blocky structure; slightly hard, friable, slightly sticky and plastic; many very fine, fine, and few medium roots; many fine and medium tubular pores; common moderately thick clay films on faces of peds and lining pores; 65 percent pebbles; neutral (pH 7.0); clear smooth boundary. (5 to 9 inches thick)

Bt2--19 to 28 inches; yellowish red (5YR 5/6) very gravelly sandy clay loam, reddish brown (5YR 4/4) moist; moderate fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and plastic; common very fine, fine, and few medium roots; many very fine and fine tubular pores; many moderately thick clay films on faces of peds and lining pores; 50 percent pebbles; neutral (pH 7.0); abrupt wavy boundary. (7 to 11 inches thick)

Bt3--28 to 41 inches; reddish brown (5YR 5/4) extremely gravelly sandy clay loam, reddish brown (5YR 4/4) moist; moderate fine and medium subangular blocky structure; hard, firm, slightly sticky and plastic; common very fine, fine and medium roots; many very fine and fine tubular pores; common moderately thick clay films on faces of peds and lining pores; 20 percent cobbles, 45 percent pebbles; neutral (pH 7.2); abrupt wavy boundary. (11 to 15 inches thick)

Bt4--41 to 50 inches; brown (7.5YR 5/4) very gravelly clay loam, dark brown (7.5YR 3/4) moist; weak fine and medium subangular blocky structure; hard, firm, sticky and plastic; few very fine and fine roots; common very fine, fine and medium pores; few moderately thick clay films on faces of peds and lining pores; 10 percent cobbles, 40 percent pebbles; neutral (pH 7.2); clear smooth boundary. (7 to 11 inches thick)

Bk--50 to 60 inches; yellowish brown (10YR 5/4) very gravelly loam, dark yellowish brown (10YR 4/4) moist; massive; hard, firm, slightly sticky and slightly plastic; many fine and medium tubular pores; common distinct lime coatings on lower surfaces of pebbles; few soft fine lime masses and filaments; 15 percent cobbles, 40 percent pebbles; neutral (pH 7.2).

**Type location:** Elko County, Nevada; about 8 miles southeast of Midas; approximately 800 feet south and 2,500 feet west of the northeast corner of section 8, T. 37 N., R. 46 E.; 41 degrees, 06

minutes, 16 seconds north latitude, 116 degrees, 48 minutes, 22 seconds west longitude.

### Range in Characteristics

*Soil moisture:* Moist in winter and spring, dry mid-July through October

*Soil temperature:* 43 to 47 degrees F.

*Mollic epipedon thickness:* 10 to 20 inches.

*Depth to base of argillic horizons:* 40 to 60 inches.

*Depth to bedrock:* 50 to 80 inches.

*Reaction:* Neutral or mildly alkaline.

*Control section:*

Clay percent--20 to 35.

Rock fragments--40 to 70 percent, dominantly pebbles.

### A horizons:

Value--3 through 5 dry, 2 through 4 moist.

Chroma--1 to 3.

### Bt horizons:

Hue--10YR, 7.5YR or 5YR.

Value--3 through 5 moist, 5 or 6 dry.

Chroma--3 through 6 dry, 3 or 4 moist.

Texture--Very gravelly sandy clay loam, extremely gravelly sandy clay loam or very gravelly clay loam with less than 35 percent silt.

Clay content--20 to 35 percent.

Rock fragments--40 to 70 percent, dominantly pebbles.

Structure--Very fine, fine or medium subangular blocky.

### Bk horizon: (When present):

Value--4 to 5 moist.

Chroma--3 or 4.

Rock fragments--40 to 80 percent, dominantly pebbles with cobbles dominant in some pedons.

## Pernty Series

The Pernty series consists of shallow, well drained soils that formed in residuum and some colluvium from rhyolite, quartzite, sandstone, conglomerate, chert, welded tuff and andesite. Pernty soils are on mountain and hill crests and side slopes. Slopes are 2 to 75 percent. The mean annual precipitation is about 11 inches and the mean annual temperature is about 43 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, frigid Lithic Argixerolls

**Typical pedon:** Pernty very gravelly loam, 30 to 50 percent slopes, located in an area of map unit 270. (Colors are for dry soil unless otherwise noted.) The soil surface is covered with 40 percent pebbles, 10 percent cobbles.



- A1--0 to 1 inch; grayish brown (10YR 5/2) very gravelly loam, very dark grayish brown (10YR 3/2) moist; weak fine subangular blocky structure; slightly hard, friable, nonsticky and nonplastic; common very fine roots; many very fine and few fine pores; 40 percent pebbles and 5 percent cobbles; neutral (pH 7.2); abrupt wavy boundary.
- A2--1 to 5 inches; brown (10YR 5/3) very gravelly loam, dark brown (10YR 3/3) moist; weak fine subangular blocky structure; slightly hard, friable, nonsticky and nonplastic; common very fine and few fine roots; many very fine and few fine tubular pores; 30 percent pebbles and 10 percent cobbles; neutral (pH 7.2); clear wavy boundary. (Combined thickness of A horizons is 2 to 5 inches)
- Bt1--5 to 10 inches; brown (10YR 5/3) very cobbly clay loam, dark brown (10YR 3/3) moist; moderate fine and medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; few very fine roots; many very fine and few fine tubular pores; many thin clay films on faces of peds; 30 percent pebbles and 20 percent cobbles; neutral (pH 7.3); abrupt wavy boundary. (4 to 6 inches thick)
- Bt2--10 to 14 inches; yellowish brown (10YR 5/4) very cobbly clay loam, dark yellowish brown (10YR 4/4) moist; moderate fine and medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; few very fine roots; many very fine and few fine tubular pores; many thin clay films on faces of peds; 30 percent pebbles and 20 percent cobbles, neutral (pH 7.3). (4 to 6 inches thick)
- R--14 inches; fractured quartzite.

**Type location:** Elko County, Nevada; approximately 40 miles northwest of Elko; about 2,200 feet south and 1,850 feet east of the northwest corner of section 19, T. 39 N., R. 53 E.; 41 degrees, 40 minutes, 00 seconds north latitude, 116 degrees, 03 minutes, 25 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Usually dry; moist in some part from late October through early June and is dry for 90 to 120 consecutive days

*Soil temperature:* 42 to 47 degrees.

*Average summer soil temperature:* 59 to 64 degrees F.

*Mollic epipedon thickness:* 7 to 10 inches, includes the upper Bt horizons.

*Depth to base of Bt horizon:* 14 to 20 inches.

*Depth to lithic contact:* 14 to 20 inches.

*Control section:*

Clay content--25 to 35 percent, when mixed.

Rock fragments--35 to 50 percent when mixed, mainly pebbles or cobbles.

**A horizons:**

Chroma--2 or 3.

**Bt horizons:**

Value--5 or 6 dry, 3 or 4 moist.

Chroma--3 or 4.

Texture--Very gravelly clay loam, gravelly loam, very gravelly loam or very cobbly clay loam, very stony clay loam.

Structure--Weak or moderate subangular blocky or is massive.

## Petan Series

The Petan series consists of shallow, well drained soils that formed in residuum from rhyolite and basalt. Petan soils are on side slopes of hills, plateaus and fan piedmonts and have slopes of 4 to 15 percent. Mean annual precipitation is about 14 inches and the mean annual temperature is about 43 degrees F.

**Taxonomic class:** Clayey-skeletal, montmorillonitic, frigid, shallow Typic Durixerolls

**Typical pedon:** Petan extremely stony loam, 4 to 15 percent slopes, located in an area of map unit 3710. (Colors are for dry soil unless otherwise noted.) The soil surface is covered with 5 percent pebbles, 30 percent cobbles and 10 percent stones.

A1--0 to 3 inches; grayish brown (10YR 5/2) extremely stony loam, very dark grayish brown (10YR 3/2) moist; moderate thick platy structure; soft, friable, slightly sticky and slightly plastic; common very fine roots; common very fine tubular pores; 10 percent pebbles; 25 percent cobbles, 30 percent stones; neutral (pH 7.2); clear smooth boundary. (2 to 4 inches thick)

A2--3 to 6 inches; brown (10YR 5/3) very stony clay loam, dark brown (10YR 3/3) moist; moderate fine granular structure; hard, firm, sticky and plastic; few fine and very fine roots; few very fine tubular pores; 5 percent pebbles, 10 percent cobbles, 25 percent stones; neutral (pH 7.2); abrupt smooth boundary. (2 to 6 inches thick)

Bt1--6 to 10 inches; brown (10YR 5/3) very cobbly clay, dark brown (10YR 3/3) moist; moderate fine subangular blocky structure; very hard, very firm, very sticky and very plastic; few very fine roots; many thin clay films on peds; 15 percent pebbles, 25 percent cobbles; neutral (pH 7.2); clear smooth boundary. (3 to 5 inches thick)

Bt2--10 to 19 inches; dark yellowish brown (10YR 4/4) very cobbly clay, dark brown (10YR 4/3) moist; moderate medium prismatic structure that parts to strong medium angular blocky; extremely hard, extremely firm, very sticky and very plastic; many moderately thick clay films on peds; 15 percent pebbles, 40 percent cobbles; mildly alkaline (pH 7.4); abrupt smooth boundary. (6 to 9 inches thick)

Bqkm--19 to 20 inches; very pale brown (10YR 8/3) indurated laminae 1/8 to 1/2 inch thick over a

degrading duripan; extremely hard, extremely firm; strongly effervescent; moderately alkaline (pH 8.2); abrupt smooth boundary. (1/2 to 3 inches thick)  
R--20 inches; basalt

**Type location:** Elko County, Nevada; Owyhee Desert, in an unsectionized area, approximately 6 miles north of Josephine Reservoir; 41 degrees, 59 minutes, 35 seconds north latitude, 116 degrees, 28 minutes, 05 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Moist in winter and spring, dry from mid July through October

*Soil temperature:* 44 to 47 degrees F.

*Thickness of mollic epipedon:* 7 to 12 inches, includes the upper part of the Bt2 horizon.

*Depth to base of argillic horizon:* 14 to 20 inches.

*Depth to duripan:* 14 to 20 inches.

*Depth to bedrock:* 15 to 23 inches.

*Control section:*

Clay content--40 to 60 percent.

#### A horizons:

Value--5 or 6 dry, thin layers with value of 6 dry, when mixed with the upper 7 inches, has a dominant value of less than 5.5 dry.

Chroma--2 or 3.

#### Bt horizons:

Value--4 to 6 dry, 3 or 4 moist.

Chroma--3 or 4.

Rock fragments--35 to 55 percent, mainly cobbles or stones.

Other features--Darker value and chroma in upper Bt2 horizon.

Reaction--Slightly acid to mildly alkaline.

## Pie Creek Series

The Pie Creek series consists of moderately deep, well drained soils that formed in residuum weathered from tuff. Pie Creek soils are on rolling low hills and mountains. Slopes are 4 to 50 percent. The mean annual precipitation is about 11 inches and the mean annual air temperature is about 43 degrees F.

**Taxonomic class:** Very-fine, montmorillonitic, frigid  
Aridic Palexerolls

**Typical pedon:** Pie Creek very cobbly silt loam, 4 to 15 percent, located in an area of map unit 580. (Colors are for dry soil unless otherwise noted.) The soil surface is covered with 30 percent pebbles and 20 percent cobbles.

A1--0 to 4 inches; grayish brown (10YR 5/2) very cobbly silt loam, very dark grayish brown (10YR

3/2) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine interstitial pores; 30 percent pebbles and 20 percent cobbles; neutral (pH 7.0); abrupt smooth boundary. (1 to 6 inches thick)

E--4 to 5 inches; light brownish gray (10YR 6/2) very cobbly silt loam; dark grayish brown (10YR 4/2) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine, and few medium roots; many very fine interstitial pores; 20 percent pebbles and 20 percent cobbles, neutral (pH 7.0); abrupt smooth boundary. (1 to 3 inches thick)

Bt1--5 to 11 inches; brown (10YR 5/3) clay, dark brown (10YR 3/3) moist; strong medium and coarse prismatic structure; very hard, very firm, very sticky and very plastic; common very fine and few fine roots mainly along faces of peds; few very fine tubular pores; many stress surfaces on faces of peds, and many thick clay films lining pores; 5 percent pebbles; mildly alkaline (pH 7.6); clear smooth boundary. (4 to 9 inches thick)

Bt2--11 to 16 inches; light yellowish brown (10YR 6/4) clay, yellowish brown (10YR 5/4) moist; strong medium prismatic structure; very hard, very firm, very sticky and very plastic; common very fine and few fine roots mainly along faces of peds; few very fine tubular pores; many stress surfaces and common thick clay films lining pores; 5 percent pebbles; moderately alkaline (pH 8.4); gradual smooth boundary. (5 to 12 inches thick)

Bt3--16 to 23 inches; very pale brown (10YR 7/3) clay, yellowish brown (10YR 5/4) moist; moderate medium and coarse subangular blocky structure; hard, firm, sticky and plastic; few very fine roots; common very fine tubular pores; common moderately thick clay films on faces of peds and lining pores; mildly alkaline (pH 7.4); clear smooth boundary. (0 to 10 inches thick)

R--23 inches; tuff.

**Type location:** Elko County, Nevada; approximately 5 miles southeast of St. John's Ranch, in an unsectionized area, about 1,900 feet north and 2,700 feet east of Chicken Springs; 41 degrees, 08 minutes, 30 seconds north latitude, 116 degrees, 26 minutes, 35 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Moist in winter and spring, dry early June to early October

*Soil temperature:* 44 to 47 degrees F.

*Depth to bedrock:* 23 to 40 inches.

*Control section:*

Clay content--60 to 70 percent.

Rock fragments--Less than 5 percent pebbles.



**A horizons:**

Chroma--2 or 3.

Structure--Weak very thin or thin platy, weak to strong very fine to medium subangular blocky or it is massive.

**E horizon:**

Value--5 through 7 dry, 3 or 4 moist.

Chroma--2 or 3.

Texture--Loam or silt loam.

Structure--Weak medium prismatic or very fine or fine subangular blocky.

**Bt horizons:**

Hue--5YR to 10YR.

Value--4 through 6 dry, 3 or 4 moist.

Chroma--3 or 4.

Structure--Medium or coarse columnar or prismatic.

Reaction--Neutral or mildly alkaline.

**Piline Series**

The Piline series consists of very deep, poorly drained soils that formed in alluvium from mixed sources. Piline soils are on internally drained areas of small relict lake plains, alluvial flats and playas. Slopes are 0 to 2 percent. Mean annual precipitation is about 9 inches and the mean annual temperature is about 47 degrees F.

**Taxonomic class:** Fine, montmorillonitic, mesic Aquic Chromoxererts

**Typical pedon:** Piline silty clay loam located in an area of map unit 2555. (Colors are for dry soil unless otherwise noted.) The soil surface has gilgai that are 2 to 6 centimeters high.

**A1**--0 to 2 inches; light brownish gray (10YR 6/2) silty clay loam, grayish brown (2.5Y 5/2) moist; moderate fine granular structure; slightly hard, firm, sticky and very plastic; few fine, common very fine roots; common fine, few very fine tubular pores; mildly alkaline (pH 7.8); abrupt smooth boundary. (2 to 4 inches thick)

**A2**--2 to 12 inches; light brownish gray (2.5Y 6/2) silty clay loam, grayish brown (2.5Y 5/2) moist; weak medium subangular blocky structure parting to moderate fine granular; very hard, very firm, sticky and very plastic; few fine and very fine roots; few fine tubular pores; few iron manganese concretions; mildly alkaline (pH 7.8); gradual smooth boundary. (6 to 11 inches thick)

**C1**--12 to 19 inches; light brownish gray (2.5Y 6/2) clay, grayish brown (2.5Y 5/2) moist; few fine distinct dark yellowish brown (10YR 3/4) mottles; moderate medium subangular blocky structure; very hard, very firm, very sticky and very plastic; few very fine roots; few fine tubular pores; common iron

manganese concretions; mildly alkaline (pH 7.6); gradual wavy boundary. (6 to 17 inches thick)  
**C2**--19 to 48 inches; light brownish gray (2.5Y 6/2) clay, grayish brown (2.5Y 5/2) moist; common fine distinct dark yellowish brown (10YR 3/4) mottles; weak coarse prismatic structure; extremely hard, very firm, very sticky and very plastic; few fine roots; common iron manganese concretions; mildly alkaline (pH 7.6); gradual wavy boundary. (13 to 32 inches thick)  
**C3**--48 to 60 inches; light brownish gray (2.5Y 6/2) clay loam, grayish brown (2.5Y 5/2) moist; massive; very hard, very firm, very sticky and very plastic; common iron manganese concretions; mildly alkaline (pH 7.6).

**Type location:** Elko County, Nevada; Owyhee Desert, in an unsectionized area, about 7 miles west of Desert Ranch Reservoir; 41 degrees, 40 minutes, 19 seconds north latitude, 116 degrees, 40 minutes, 28 seconds west longitude.

**Range in Characteristics**

**Soil moisture:** Usually dry; moist in winter and spring, dry late May through November

**Soil temperature:** 47 to 52 degrees F.

**Reaction:** Neutral to moderately alkaline.

**Control section:**

Clay content--35 to 50 percent.

**Other features:** When dry, vertical cracks 1 centimeter or more in width, extend to a depth of more than 40 inches. Gilgai are 2 to 10 centimeters in height. Few to many iron-manganese concretions can occur in any horizon.

**A horizons:**

Hue--10YR or 2.5Y

Value--6 or 7 dry, 5 or 6 moist.

Chroma--2 or 3

Reaction--Neutral to mildly alkaline.

**C horizons:**

Hue--10YR or 2.5Y

Value--6 or 7 dry, 5 or 6 moist.

Chroma--2 or 3

Textures--Dominantly clay or silty clay but contains clay loam in the lower substratum.

Iron mottles--Few to many and fine to medium in the lower subhorizons, but common or many or distinct or prominent mottles are within 20 inches of the surface

**Placeritos Series**

The Placeritos series consists of very deep, somewhat poorly drained soils that formed in mixed alluvium. The Placeritos soils are on floodplains. Slopes are 0 to 2 percent. The mean annual precipitation is

about 8 inches and the mean annual temperature is about 50 degrees F.

**Taxonomic class:** Fine-silty, mixed (calcareous), mesic Aquic Xerofluvents

**Typical pedon:** Placeritos silt loam, 0 to 2 percent slopes, is located in an area of Creemon-Placeritos association. (Colors are for dry soil unless otherwise noted.)

A1--0 to 2 inches; light grayish brown (10YR 6/2) silt loam, dark grayish brown (10YR 4/2) moist; moderate very thin platy structure; slightly hard, very friable, slightly sticky, slightly plastic; many very fine and fine and few medium roots; many very fine tubular and vesicular pores; slightly effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (1 to 9 inches thick)

A2--2 to 8 inches; light gray (10YR 7/2) silt loam, dark grayish brown (10YR 4/2) moist; moderate medium and thick platy structure; slightly hard, very friable, slightly sticky, slightly plastic; many very fine and fine and few medium roots; many very fine tubular and vesicular pores; slightly effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (0 to 7 inches thick)

A3--8 to 13 inches; light gray (10YR 7/2) silt loam, dark grayish brown (10YR 4/2) moist; moderate thin and thick platy structure; slightly hard, very friable, slightly sticky, slightly plastic; common very fine roots; many fine and common medium tubular pores; slightly effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (0 to 6 inches thick)

C1--13 to 20 inches; light gray (10YR 7/2) silt loam, dark grayish brown (10YR 4/2) moist; moderate medium subangular blocky structure parting to moderate very thin platy; slightly hard, very friable, slightly sticky, slightly plastic; common very fine and fine roots; many very fine and few medium tubular pores; slightly effervescent; strongly alkaline (pH 8.6); clear smooth boundary. (9 to 20 inches thick)

C2--20 to 32 inches; white (10YR 8/2) silt loam, dark grayish brown (10YR 4/2) moist; massive; slightly hard, very friable, slightly sticky, slightly plastic; common very fine roots; common very fine tubular pores; ash layer; moderately alkaline (pH 8.4); abrupt wavy boundary. (8 to 15 inches thick)

2A1b--32 to 39 inches; gray (10YR 5/1) silty clay loam, very dark gray (10YR 3/1) moist; few fine distinct mottles of strong brown (7.5YR 5/6) moist; strong medium prismatic structure; hard, friable; sticky, plastic; many very fine roots matted on faces of peds and within peds; many very fine tubular pores; moderately alkaline (pH 8.2); abrupt wavy boundary. (0 to 10 inches thick)

2A2b--39 to 50 inches; gray (10YR 5/1) silty clay loam, very dark gray (10YR 3/1) moist; few fine distinct mottles of strong brown (7.5YR 5/6) moist;

strong medium prismatic structure parting to moderate medium subangular blocky; hard, friable, sticky, plastic; common very fine and fine roots; common very fine tubular pores; moderately alkaline (pH 8.0); abrupt wavy boundary. (0 to 15 inches thick)

2Cg--50 to 60 inches; light olive gray (5Y 6/2) clay loam, olive gray (5Y 5/2) moist; many medium distinct mottles of yellow (5Y 7/6) moist; strong medium prismatic structure parting to moderate medium subangular blocky; hard, friable, sticky, plastic; common very fine and fine roots; common very fine tubular pores; moderately alkaline (pH 7.8).

**Type location:** Elko County, Nevada; approximately 12 miles southwest of Midas; about 1,600 feet east and 100 feet north of the southwest corner of section 25, T. 38 N., R. 44 E.; 41 degrees, 08 minutes, 09 seconds north latitude, 116 degrees, 57 minutes, 46 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Usually moist in the winter and spring months, dry during the summer and fall.

*Soil temperature:* 51 to 57 degrees F.

*Control section:*

Clay content--18 to 27 percent.

Rock fragment--15 percent fine sand and coarser.

#### A horizons:

Hue--10YR or 2.5Y but can be 5Y in the lower horizons having color values of 5 dry and 3 moist are less than 4 inches thick or occur below 20 inches.

Value--5 through 7 dry, 3 through 5 moist.

Chroma--1 through 3 (chromas of 1 are in the buried A horizons).

#### C horizons:

Hue--10YR, 2.5Y or 5Y

Value--6 or 7 dry, 4 or 5 moist.

Chroma--2 or 3

Structure--Massive but can have weak or moderate coarse to fine subangular blocky, or weak thick platy structure.

Texture--Stratified silt loam, very fine sandy loam, and silty clay loam with thin strata of loam, fine sandy loam or silty clay can occur in the control sections, and textures from clay to sand can occur in the substratums.

Reaction--Moderately alkaline to very strongly alkaline.

Calcium carbonate--1 to 10 percent and is mainly disseminated. Few to common fine segregated seams and filaments of lime can occur in the C horizons of some pedons, and a few small lime concretions can occur in the lower substratum.



## Puett Series

The Puett series consists of shallow, well drained soils that formed in residuum and colluvium from weathered tuff, tuffaceous sandstone and siltstone. Puett soils are on low hills, side slopes of plateaus, rock pediments, rock core areas of fan piedmont remnants and partial ballenas. Slopes are 4 to 75 percent. The mean annual precipitation is about 9 inches and mean annual temperature is about 47 degrees F.

**Taxonomic class:** Loamy, mixed (calcareous), mesic, shallow Xeric Torriorthents

**Typical pedon:** Puett gravelly loam, 30 to 50 percent slopes, is located in an area of the map unit 2668. (Colors are for dry soils unless otherwise noted.) The soil surface is partially covered with 30 percent pebbles and 5 percent cobbles.

A--0 to 3 inches; very pale brown (10YR 7/3) gravelly loam, brown (10YR 5/3) moist; weak thin platy structure; soft, friable, slightly sticky and slightly plastic; common very fine roots; many very fine and fine irregular and vesicular pores; 15 percent pebbles; violently effervescent; moderately alkaline (pH 8.2); clear wavy boundary. (1 to 7 inches thick)

C1--3 to 10 inches; pale brown (10YR 6/3) gravelly loam, yellowish brown (10YR 5/4) moist; massive; hard, friable, slightly sticky and slightly plastic; common very fine and fine, few medium roots; many very fine irregular pores; 30 percent pebbles; violently effervescent; moderately alkaline (pH 8.2); abrupt wavy boundary. (3 to 15 inches thick)

Cr--11 to 20 inches; soft weathered tuff.

**Type location:** Elko County, Nevada; approximately 8 miles north of Midas; about 1,685 feet north and 1,450 feet east of the southwest corner of section 10, T. 40 N., R. 46 E.; 41 degrees, 21 minutes, 32 seconds north latitude, 116 degrees, 45 minutes, 42 seconds west longitude.

### Range in Characteristics

**Soil moisture:** Usually dry; moist in winter and spring, dry June through October

**Soil temperature:** 47 to 52 degrees F.

**Depth to bedrock:** 10 to 20 inches.

**Reaction:** Moderately alkaline or strongly alkaline.

**Carbonates:** Strongly or violently effervescent, throughout. Lime coats on pebbles in lower part of some pedons.

**Control section:**

Clay content--5 to 10 percent.

Rock fragments--Up to 35 percent pebbles.

**A horizon:**

Hue--10YR or 2.5Y.

Value--6 or 7 dry, 4 or 5 moist.

Chroma--2 through 4.

**C horizons:**

Hue--10YR or 2.5Y.

Value--6 through 8 dry, 4 or 5 moist.

Chroma--2 through 4.

Texture--Loamy fine sand to loam but is dominantly coarse sandy loam to loam. Gravelly loam or gravelly sandy loam is common in some pedons.

Structure--Subangular blocky or it is massive.

Consistence--Soft to hard, dry; nonsticky or slightly sticky and nonplastic or slightly plastic, wet.

## Puett Variant

The Puett variant consists of shallow, well drained soils that formed in residuum from tuff. The Puett variant soils are on side slopes of hills. Slopes are 30 to 50 percent. The mean annual precipitation is about 9 inches and the mean annual temperature is about 47 degrees F.

**Taxonomic class:** Loamy, mixed (calcareous), mesic Lithic Torriorthents.

**Typical pedon:** Puett variant gravelly loam, 30 to 50 percent slopes, located in an area of Map Unit 1855. (Colors are for dry soil unless otherwise noted.) The soil surface is covered with 20 percent pebbles, 5 percent cobbles.

A1--0 to 2 inches; very pale brown (10YR 7/3) gravelly loam, yellowish brown (10YR 5/4) moist; strong very fine platy structure; soft, very friable, nonsticky, slightly plastic; few very fine roots; many fine and medium vesicular and common fine tubular pores; 15 percent pebbles, 1 percent cobbles; strongly effervescent; strongly alkaline (pH 8.6); clear smooth boundary. (1 to 4 inches thick)

A2--2 to 6 inches; very pale brown (10YR 7/3) gravelly loam, yellowish brown (10YR 5/4) moist; strong very fine platy structure; slightly hard, very friable, nonsticky, slightly plastic; common very fine roots; common very fine tubular pores; 15 percent pebbles; strongly effervescent; strongly alkaline (pH 8.8); abrupt clear smooth. (3 to 5 inches thick)

C--6 to 17 inches; very pale brown (10YR 7/3) gravelly loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, very friable, slightly plastic; common very fine and fine roots; common very fine and few medium tubular pores; 20 percent pebbles, 2 percent cobbles; strongly effervescent; strongly

alkaline (pH 8.8); abrupt wavy boundary. (5 to 12 inches thick)

R--17 inches; welded tuff.

**Type location:** Elko County, Nevada; approximately 13 miles west of Midas; about 3,800 feet east and 200 feet north of the southwest corner of section 15, T. 38 N., R. 44 E., 41 degrees, 09 minutes, 58 seconds north latitude, 117 degrees, 00 minutes, 05 seconds west longitude.

#### Range in characteristics:

*Soil moisture:* Moist in winter and spring, dry mid-June through October.

*Soil temperature:* 47 to 52 degrees F.

*Depth to bedrock:* 10 to 20 inches.

#### Control section:

Clay content = 10 to 15 percent.

Rock fragments = 15 to 35 percent, mainly pebbles.

#### A horizon:

Value = 6 or 7 dry, 4 or 5 moist.

#### C horizon:

Value = 6 or 7 dry, 4 or 5 moist.

## Quarz Series

The Quarz series consists of moderately deep, well drained soils that formed in residuum and colluvium from sandstone, shale, chert, conglomerate, quartzite, quartz latite, welded tuffs, andesite or rhyolite. Quarz soils are on low rock pediment remnants, plateaus, low hills and mountain side slopes. Slopes are 4 to 50 percent. The mean annual precipitation is about 12 inches and the mean annual temperature is about 44 degrees F.

**Taxonomic class:** Clayey-skeletal, montmorillonitic, frigid Aridic Argixerolls

**Typical pedon:** Quarz very stony loam, 15 to 50 percent slopes, is located in an area of map unit 1725. (Colors are for dry soils unless otherwise noted.). The surface is covered with 15 percent pebbles and 5 percent cobbles and 5 percent stones.

A1--0 to 4 inches; brown (10YR 5/3) very gravelly loam, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure; slightly hard, very friable, sticky and plastic; many very fine and fine roots; many very fine, fine and medium vesicular and few fine tubular pores; 30 percent

pebbles and 10 percent cobbles, 5 percent stones; neutral (pH 7.2); clear smooth boundary. (2 to 16 inches thick)

Bt1--4 to 12 inches; brown (10YR 5/3) very cobbly clay loam, dark brown (10YR 3/3) moist; moderate, medium subangular blocky structure; hard, friable, very sticky and plastic; many very fine and fine, and few medium roots; many very fine and fine tubular pores; common moderately thick clay films in pores, bridging sand grains and on faces of peds; 25 percent pebbles and 15 percent cobbles; neutral (pH 7.2); clear smooth boundary. (4 to 10 inches thick)

Bt2--12 to 17 inches; yellowish brown (10YR 5/4) very gravelly clay, dark yellowish brown (10YR 4/4) moist; moderate, medium subangular blocky structure; hard, firm, very sticky and very plastic; common very fine and few fine roots; common fine tubular pores; many thick clay films in pores, bridging sand grains and on faces of peds; 40 percent pebbles and 10 percent cobbles; neutral (pH 7.2); clear smooth boundary. (5 to 15 inches thick)

Bt3--17 to 26 inches; yellowish brown (10YR 5/4) very gravelly clay, dark yellowish brown (10YR 4/4) moist; massive; hard, firm, very sticky and very plastic; few fine roots; common fine tubular pores; many thick clay films in pores, bridging sand grains and on faces of peds; few medium soft lime masses and threads; 40 percent pebbles and 15 percent cobbles; neutral (pH 7.0); abrupt wavy boundary. (0 to 10 inches thick)

R--26 inches; highly fractured welded tuff.

**Type location:** Elko County, Nevada; approximately 2 miles southeast of Eagle Rock Reservoir; about 1,500 feet south and 2,000 feet east of the northwest corner of section 21, T. 38 N., R. 53 E.; 41 degrees, 10 minutes, 25 seconds north latitude, 116 degrees, 08 minutes, 40 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Moist in winter and spring, dry late July through October

*Soil temperature:* 44 to 47 degrees F.

*Depth to bedrock:* 20 to 40 inches.

*Mollic epipedon thickness:* 7 to 16 inches which includes the upper part of the argillic horizon in some pedons.

*Reaction:* Neutral or mildly alkaline.

#### Control section:

Clay content--35 to 55 percent.

Rock fragments--Averages 35 to 60 percent, mainly pebbles with up to 15 percent that are cobbles or stones.

#### A horizon:

Value--4 or 5 dry, 2 or 3 moist.

Chroma--2 or 3.



**Bt horizons:**

Hue--5YR, 7.5YR or 10YR.

Value--4 through 6 dry, 3 or 4 moist.

Chroma--3 through 5.

Texture--Dominantly very gravelly clay loam or very gravelly clay with very cobbly clay loam or extremely gravelly clay common in some subhorizons.

Structure--Subangular blocky, angular blocky or prismatic.

## Ramires Series

The Ramires series consists of moderately deep, well drained soils that formed in residuum from tuff, andesite and rhyolite with a component of loess high in volcanic ash. Ramires soils are on side slopes of hills and mountains and fan piedmonts with a rock core. Slopes are 15 to 50 percent. Mean annual precipitation is about 11 inches and mean temperature is about 44 degrees F.

**Taxonomic class:** Fine, montmorillonitic, frigid Aridic Calcic Argixerolls

**Typical pedon:** Ramires silt loam, 8 to 15 percent slopes, located in an area of map unit 2803. (Colors are for dry soil unless otherwise noted.) The soil surface is covered with 15 percent pebbles and 5 percent cobbles.

A1--0 to 2 inches; brown (10YR 5/3) silt loam, dark brown (10YR 3/3) moist; weak medium platy structure parting to moderate fine and very fine granular; soft, very friable, slightly sticky and slightly plastic; few medium, many fine and very fine roots; common medium, many fine and very fine interstitial pores; 10 percent pebbles; mildly alkaline (pH 7.8); gradual wavy boundary. (1 to 4 inches thick)

A2--2 to 5 inches; brown (10YR 5/3) silt loam, dark brown (10YR 3/3) moist; weak thin platy structure parting to moderate medium and fine granular; soft, very friable; slightly sticky and slightly plastic; few medium, many fine and very fine roots; common medium and many fine and very fine interstitial pores; 5 percent pebbles; mildly alkaline (pH 7.8); clear wavy boundary. (3 to 9 inches thick)

Bt1--5 to 9 inches; brown (10YR 5/3) clay loam, dark brown (10YR 3/3) moist; weak medium prismatic structure parting to moderate medium and coarse subangular blocky; hard, firm, sticky and plastic; many fine, common medium and very fine roots; many fine, few medium interstitial and tubular pores; common moderately thick clay films on faces of peds and lining pores; 10 percent pebbles; moderately alkaline (pH 8.0); clear wavy boundary. (4 to 8 inches thick)

Bt2--9 to 14 inches; yellowish brown (10YR 5/4) clay loam, dark yellowish brown (10YR 4/4) moist; weak medium prismatic structure parting to moderate medium subangular blocky; hard, firm, sticky and plastic; common fine, few medium and very fine roots; common fine and very fine interstitial pores; common moderately thick clay films on faces of peds and lining pores; 10 percent pebbles; moderately alkaline (pH 8.0); clear smooth boundary. (5 to 12 inches thick)

Btk--14 to 24 inches; pale brown (10YR 6/3) gravelly clay loam, dark yellowish brown (10YR 4/4) moist; weak coarse subangular blocky structure; hard, friable, sticky and plastic; common medium and fine roots; common medium and fine interstitial pores; few thin clay films on faces of peds; 25 percent pebbles; slightly effervescent, lime is disseminated; moderately alkaline (pH 8.4); gradual wavy boundary. (0 to 10 inches thick)

Bk--24 to 40 inches; pale brown (10YR 6/3) very cobbly loam, yellowish brown (10YR 5/4) moist; massive; hard, friable, nonsticky and nonplastic; few medium and fine roots; few medium and fine interstitial pores; 20 percent pebbles, 30 percent cobbles; few fine soft masses of lime, strongly effervescent; moderately alkaline (pH 8.4); clear wavy boundary. (4 to 16 inches thick)

R--40 inches; welded tuff.

**Type location:** Elko County, Nevada; in an unsectionized area, approximately 7 miles southwest of Wilson Reservoir; 41 degrees, 35 minutes, 02 seconds north latitude, 116 degrees, 25 minutes, 25 seconds west longitude.

### Range in Characteristics

**Soil moisture:** Moist in winter and spring, dry mid June to mid October

**Soil temperature:** 45 to 47 degrees F.

**Mollic epipedon thickness:** 8 to 15 inches and commonly includes the upper Bt horizons.

**Depth to the base of the Bt horizon:** 20 to 36 inches.

**Depth to bedrock:** 24 to 40 inches.

**Other features:** Some pedons lack Bk horizons, but have a lower Btk subhorizon that extends to the bedrock, or have Btk horizons above the Bk.

**Control section:**

Clay content--35 to 50 percent.

Rock fragments--Up to 35 percent, mainly pebbles with some cobbles.

**A horizons:**

Chroma--1 through 3.

Reaction--Neutral or mildly alkaline.

**Bt and Btk horizons:**

Value--5 or 6 dry, 3 or 4 moist.

Chroma--2 through 4.

Texture--Gravelly clay, gravelly sandy clay, gravelly clay loam, clay loam or clay. Some pedons have a thin subhorizon of very gravelly clay above the lithic contact.

Structure--Weak to strong medium or coarse subangular blocky, weak or moderate fine to coarse prismatic.

Consistence--Hard or very hard, friable or firm, sticky or very sticky, plastic or very plastic.

Reaction--Neutral to moderately alkaline.

Other features--The lower Bt subhorizons of some pedons contain secondary carbonates.

#### **Bk horizon:**

Value--4 through 7 moist.

Chroma--2 through 4.

Texture--Sandy clay loam or sandy loam.

Rock fragments--10 to 50 percent, mainly pebbles and cobbles.

## **Ratsow Series**

The Ratsow series consists of moderately deep, well drained soils that formed in residuum from rhyolite. Ratsow soils are on hills. Slopes are 0 to 15 percent. Mean annual precipitation is about 11 inches and the mean annual temperature is about 43 degrees F.

**Taxonomic class:** Fine, montmorillonitic, frigid Xerollic Durargids

**Typical pedon:** Ratsow loam, 4 to 15 percent slopes, located in an area of map unit 3100. (Colors are for dry soil unless otherwise noted.)

Al--0 to 2 inches; light brownish gray (10YR 6/2) loam, very dark grayish brown (10YR 3/2) moist; weak medium platy structure; soft, very friable, slightly sticky and slightly plastic; common very fine roots; common very fine vesicular pores; mildly alkaline (pH 7.4); clear smooth boundary. (1 to 3 inches thick)

A2--2 to 7 inches; pale brown (10YR 6/3) very fine sandy loam, dark brown (10YR 3/3) moist; moderate thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; few fine tubular pores; mildly alkaline (pH 7.4); clear smooth boundary. (3 to 6 inches thick)

Bt1--7 to 15 inches; light yellowish brown (10YR 6/4) clay loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; very hard, firm, sticky and plastic; few medium, fine, and very fine roots; few fine and very fine tubular pores; few thin clay films lining pores; mildly alkaline (pH 7.4); clear smooth boundary. (5 to 9 inches thick)

Bt2--15 to 23 inches; yellowish brown (10YR 5/4) clay, dark yellowish brown (10YR 4/4) moist; weak coarse prismatic structure parting to strong medium angular blocky; extremely hard, very firm, very

sticky and very plastic; few medium, fine, and very fine roots; many moderately thick clay films on faces of peds; 5 percent pebbles; mildly alkaline (pH 7.4); clear smooth boundary. (7 to 9 inches thick)

Btk--23 to 27 inches; yellowish brown (10YR 5/6) clay loam, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure; hard, very firm, sticky and very plastic; few very fine roots; few very fine tubular pores; common moderately thick clay films on faces of peds; 5 percent pebbles; few medium lime filaments; slightly effervescent; moderately alkaline (pH 8.0); clear smooth boundary. (2 to 5 inches thick)

Bk--27 to 29 inches; very pale brown (10YR 7/3) loam, yellowish brown (10YR 5/4) moist; massive; hard, firm, slightly sticky and slightly plastic; 10 percent pebbles; common fine lime in soft masses; violently effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary. (0 to 2 inches thick)

Bqkm--29 to 30 inches; very pale brown (10YR 7/3) indurated duripan, pale brown (10YR 6/3) moist; silica lamina are 3 millimeters thick; extremely hard, extremely firm; thick root mat on surface of duripan; violently effervescent; strongly alkaline (pH 8.6); abrupt smooth boundary. (1/2 to 4 inches thick)

R--30 inches; rhyolite.

**Type location:** Elko County, Nevada; Owyhee Desert, in an unsectionized area, about 12 miles northwest of Midas; 41 degrees, 24 minutes, 20 seconds north latitude, 116 degrees, 54 minutes, 09 seconds west longitude.

#### **Range in Characteristics**

*Soil moisture:* Usually dry; moist in winter and spring, dry in early June through October

*Soil temperature:* 44 to 47 degrees F.

*Solum thickness:* 18 to 30 inches.

*Depth to the base of the argillic horizons:* 18 to 30 inches.

*Depth to duripan:* 20 to 30 inches.

*Depth to bedrock:* 21 to 34 inches.

*Depth to lime:* 18 to 25 inches.

*Control section:*

Clay content--35 to 50 percent.

Rock fragments--0 to 15 percent, mainly pebbles.

#### **A horizons:**

Value--3 or 4 moist.

Chroma--2 or 3.

#### **Bt1 horizon:**

Value--3 or 4 moist.

#### **Bt2 horizon:**

Value--5 or 6 dry, 4 or 5 moist.

Chroma--4 to 6.

Texture--Heavy clay loam, clay.



**Bk horizon:**

Value--5 to 7 dry, 4 or 5 moist.

Chroma--4 to 6.

Rock fragments--0 to 25 percent, mainly pebbles.

**Bqkm horizon:**

Value--7 or 8 dry, 6 or 7 moist.

Chroma--2 to 4.

Thickness of laminae--1 to 5 millimeters.

## Relley Series

The Relley series consists of very deep, well drained soils that formed in mixed silty alluvium from mostly volcanic rocks with a component of loess and volcanic ash. These soils are on fan skirts and inset fans. Slopes are 0 to 2 percent. The mean annual precipitation is about 7 inches and the mean annual temperature is about 49 degrees F.

**Taxonomic class:** Fine-silty, mixed, mesic Duric Camborthids

**Typical pedon:** Relley silt loam, 0 to 2 percent slopes, frequently flooded, is located in an area of map unit 3010. (Colors are for dry soil unless otherwise noted.)

A1--0 to 3 inches; pale brown (10YR 6/3) silt loam, brown (10YR 5/3) moist; weak thick platy structure; slightly hard, very friable, slightly sticky and slightly plastic; common coarse, medium and fine vesicular pores; moderately alkaline (pH 8.2); abrupt smooth boundary. (2 to 8 inches thick)

A2--3 to 6 inches; very pale brown (10YR 7/3) silt loam, brown (10YR 5/3) moist; moderate fine platy structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; few fine vesicular and tubular pores; moderately alkaline (pH 8.2); clear smooth boundary. (2 to 8 inches thick)

Bw--6 to 14 inches; very pale brown (10YR 7/4) silt loam, yellowish brown (10YR 5/4) moist; weak medium and fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; few coarse, medium, fine and very fine roots; few fine tubular pores; moderately alkaline (pH 8.0); clear smooth boundary. (6 to 11 inches thick)

Bq--14 to 25 inches; very pale brown (10YR 8/3) silt loam, brown (10YR 5/3) moist; massive; slightly hard, very friable, sticky and plastic; few medium and fine roots; few fine tubular pores; 25 percent brittle durinodes; moderately alkaline (pH 8.4); clear smooth boundary. (10 to 12 inches thick)

Bqk1--25 to 35 inches; very pale brown (10YR 7/4) silt loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, very friable, sticky and plastic; few fine and very fine roots; few fine tubular pores; 20 percent brittle durinodes; slightly effervescent in

spots; strongly alkaline (pH 8.6); clear smooth boundary. (4 to 14 inches thick)

Bqk2--35 to 53 inches; very pale brown (10YR 7/3) silt loam, yellowish brown (10YR 5/4) moist; common medium faint yellowish brown (10YR 5/4) mottles; massive; slightly hard, very friable, sticky and plastic; few fine and very fine roots; 25 percent brittle durinodes; slightly effervescent; lime is in few fine filaments and soft masses; strongly alkaline (pH 8.6); clear wavy boundary. (0 to 19 inches thick)

Bqk3--53 to 60 inches; light yellowish brown (10YR 6/4) silt loam, dark yellowish brown (10YR 4/4) moist; common medium faint yellowish brown (10YR 5/4) mottles; massive; hard, firm and brittle, sticky and plastic; few fine and very fine roots; weak continuous brittle matrix; violently effervescent; lime is in common medium filaments and soft masses; strongly alkaline (pH 8.6).

**Type location:** Elko County, Nevada; in an unsectionized area, about 27 miles west of Josephine Reservoir; 41 degrees, 56 minutes, 09 seconds north latitude, 116 degrees, 59 minutes, 12 seconds west longitude.

### Range in Characteristics

**Soil moisture:** Usually dry; moist in winter and spring, dry late May through November

**Soil temperature:** 47 to 53 degrees F.

**Depth to duric horizons:** 11 to 25 inches.

**Depth to carbonates:** 11 to 25 inches

**Relict mottles:** Faint or distinct relict mottles are common in any horizon below 16 inches.

**Salt and sodium:** These soils are normally moderately or strongly salt and sodium affected at depths below 30 inches.

**Other features:** Some pedons have coarse sandy loam textures below depths of 50 inches.

**Control section:**

Clay content--18 to 27 percent.

**A horizons:**

Value--6 or 7 dry, 3 through 5 moist.

Hue--2.5Y or 10YR.

Chroma--2 or 3.

Reaction--Moderately alkaline or strongly alkaline.

**Bw horizon:**

Value--6 or 7 dry, 3 through 6 moist.

Chroma--2 through 4 dry.

Structure--Prismatic, platy or subangular blocky.

Consistence--Slightly hard or hard, very friable or friable; slightly sticky or sticky and slightly plastic or plastic, wet.

Reaction--Moderately alkaline or strongly alkaline.

**Bq, Bk and Bqk horizons:**

Value--5 through 8 dry, 4 through 6 moist.

Chroma--2 through 4.

Texture--Silt loam with strata of very fine sandy loam or silty clay loam in some pedons.

Structure--Platy or it is massive.

Consistence--Slightly sticky or sticky and slightly plastic or plastic, wet.

Reaction--Moderately alkaline through very strongly alkaline.

Carbonates--Slightly to violently effervescent, noneffervescent Bq horizons are overlying Bqk horizons in some pedons.

Silica cementation--20 to 50 percent weak or strongly cemented durinodes. A 4 to 7-inch thick horizon that is 30 to 50 percent discontinuous weakly silica-cemented that is hard and brittle is common between depths of 16 to 34 inches.

Other features--A continuous weakly or strongly cemented hardpan is below 50 inches in some pedons.

pebbles; few thin clay films on faces of pedes and lining pores; mildly alkaline (pH 7.6); clear smooth boundary. (2 to 10 inches thick)

Bt2--15 to 27 inches; light yellowish brown (10YR 6/4) gravelly clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; hard, firm, sticky and plastic; common very fine and few fine roots; common very fine tubular pores; 20 percent pebbles, 7 percent cobbles; common thin clay films on faces of pedes and lining pores; mildly alkaline (pH 7.6); abrupt wavy boundary. (10 to 25 inches thick)

R--27 inches; slightly weathered rhyolite.

**Type location:** Elko County, Nevada; approximately 3 miles west of Midas; about 800 feet east and 1,200 feet south of the northwest corner of section 24, T. 39 N., R. 45 E.; 41 degrees, 14 minutes, 48 seconds north latitude, 116 degrees, 51 minutes, 03 seconds west longitude.

## Reluctan Series

The Reluctan series consists of moderately deep, well-drained soils that formed in residuum and colluvium weathered from volcanic rocks. Reluctan soils are on plateaus, hills and mountains. Slopes are 2 to 50 percent. The mean annual precipitation is about 12 inches and the mean annual temperature is about 44 degrees F.

**Taxonomic class:** Fine-loamy, mixed, frigid Aridic Argixerolls

**Typical pedon:** Reluctan cobbly loam, 15 to 30 percent slopes in an area of map unit 1711. (Colors for dry soils unless otherwise noted.) The soil surface is covered by 10 percent pebbles and 10 percent cobbles.

A1--0 to 2 inches; grayish brown (10YR 5/2) cobbly loam, very dark grayish brown (10YR 3/2) moist; moderate very fine platy structure; soft, very friable, slightly sticky and slightly plastic; many very fine roots; common very fine tubular pores; 10 percent pebbles, 10 percent cobbles; mildly alkaline (pH 7.6); clear smooth boundary. (2 to 5 inches thick)

A2--2 to 9 inches; brown (10YR 5/3) loam, very dark grayish brown (10YR 3/2) moist; moderate very fine platy structure; soft, very friable, slightly sticky and slightly plastic; many very fine, few fine and medium roots; common very fine tubular pores; 10 percent pebbles, 5 percent cobbles; mildly alkaline (pH 7.6); clear smooth boundary. (4 to 11 inches thick)

Bt1--9 to 15 inches; yellowish brown (10YR 5/4) gravelly loam, dark yellowish brown (10YR 3/4) moist; moderate medium subangular blocky structure; slightly hard, friable, sticky and plastic; common very fine, few fine and medium roots; common very fine tubular pores; 15 percent

### Range in Characteristics

*Soil moisture:* Moist in winter and spring, dry from July to October

*Soil temperature:* 44 to 47 degrees F.

*Mollic epipedon thickness:* 7 to 17 inches. Commonly includes part of argillic horizon.

*Solum thickness:* 20 to 40 inches.

*Depth to bedrock:* 20 to 40 inches.

### A horizons:

Value--4 or 5 dry.

Chroma--2 or 3.

Reaction--Neutral or mildly alkaline.

### Bt horizons:

Value--4 through 6 dry, 3 or 4 moist.

Chroma--2 through 4.

Texture--Gravelly loam or gravelly clay loam.

Clay content--25 to 35 percent.

Rock fragments--15 to 35 percent, mainly pebbles.

Consistence--Very friable to firm, moist; slightly sticky or sticky and slightly plastic or plastic, wet.

Reaction--Neutral or mildly alkaline, usually increasing with depth.

## Rugar Series

The Rugar series consists of deep, moderately well drained soils that formed in residuum from tuffaceous siltstone, claystone and sandstone. Rugar soils are on fan piedmont remnants with a rock core, concave side slopes and foot slopes of hills and mountains. Slopes are 2 to 30 percent. The mean annual precipitation is about 16 inches and the mean annual temperature is about 43 to degrees F.



**Taxonomic class:** Fine, montmorillonitic, frigid Pachic Argixerolls

**Typical pedon:** Rugar clay loam, 15 to 30 percent slopes, located in an area of map unit 1742. (Colors are for dry soil unless otherwise noted.)

Al--0 to 2 inches; grayish brown (10YR 5/2) clay loam, very dark grayish brown (10YR 3/2) moist; weak very fine and fine subangular blocky structure parting to moderate fine and medium granular; slightly hard, very friable, sticky and plastic; many very fine, common fine, and few coarse roots; common very fine and few fine tubular pores; 10 percent pebbles; neutral (pH 7.0); clear smooth boundary. (2 to 4 inches thick)

A2--2 to 20 inches; grayish brown (10YR 5/2) clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium and coarse subangular blocky structure; hard, friable, sticky and plastic; common very fine, fine, medium and few coarse roots; many very fine, fine and few medium tubular pores; 5 percent pebbles; neutral (pH 6.6); abrupt smooth boundary. (16 to 20 inches thick)

Bt1--20 to 27 inches; brown (10YR 5/3) clay, dark brown (10YR 3/3) moist; few fine prominent reddish yellow (7.5YR 6/6) moist, iron mottles; moderate medium and coarse angular blocky structure; hard, firm, sticky and very plastic; few very fine, fine and coarse roots; common very fine, fine and few medium tubular pores; common stress surfaces; few fine iron-manganese nodules; 10 percent pebbles and 2 percent cobbles; slightly acid (pH 6.2); clear wavy boundary. (6 to 12 inches thick)

Bt2--27 to 43 inches; yellowish brown (10YR 5/4) gravelly clay, dark yellowish brown (10YR 4/4) moist; common fine and medium, prominent strong brown (7.5YR 5/6) moist, iron mottles; moderate coarse and very coarse angular blocky structure; very hard, firm, very sticky and very plastic; few very fine roots; common very fine, fine, and few medium tubular pores; common stress surfaces; few, fine iron-manganese nodules; 20 percent soft weathered pebbles slightly acid (pH 6.2); clear wavy boundary. (16 to 24 inches thick)

Cr--43 to 60 inches; highly weathered soft siltstone maintaining primarily rock structure; common fine iron manganese nodules.

**Type location:** Elko County, Nevada; approximately 2 miles south of Bull Run Reservoir; about 500 feet west and 400 feet south of the northeast corner of section 29, T. 43 N., R. 52 E.; 41 degrees, 36 minutes, 10 seconds north latitude, 116 degrees, 08 minutes, 50 seconds west longitude.

#### Range in Characteristics

**Soil moisture:** Usually moist; moist in winter and spring, dry late July through late October

**Soil temperature:** 42 to 47 degrees F.

**Mollic epipedon thickness:** 24 to 36 inches.

**Depth to base of argillic horizons:** 40 to 60 inches.

**Depth to paralithic contact:** 40 to 60 inches.

**Reaction:** Neutral to slightly acid.

**Control section:**

Clay percent--40 to 55 percent.

Rock fragments--5 to 30 percent, mainly pebbles.

**Bt horizons:**

Value--3 or 4 moist.

Chroma--3 or 4 dry and moist.

Texture--Clay or gravelly clay.

Structure--Moderate medium, coarse and very coarse angular blocky; or weak medium prismatic.

Other features--Most fragments are siltstone, are soft and will slake after overnight soaking

## Shabliss Series

The Shabliss series consists of shallow over a duripan, well drained soils that formed in alluvium from mixed rock sources with a thin loess mantle high in volcanic ash. The Shabliss soils are on partial ballenas, terraces and fan piedmont remnants. Slopes are 0 to 50 percent. The mean annual precipitation is about 9 inches and the mean annual temperature is about 48 degrees F.

**Taxonomic class:** Loamy, mixed, mesic, shallow Haploxerollic Durorthids

**Typical pedon:** Shabliss very fine sandy loam, 0 to 2 percent slopes, located in an area of map unit 1351. (Colors are for dry soil unless otherwise noted).

A1--0 to 2 inches; pale brown (10YR 6/3) very fine sandy loam, dark brown (10YR 4/3) moist; weak thin platy structures; soft, very friable, slightly sticky and slightly plastic; few fine roots; common medium vesicular pores; moderately alkaline (pH 8.2); abrupt smooth boundary.

A2--2 to 6 inches; pale brown (10YR 6/3) very fine sandy loam, dark brown (10YR 4/3) moist; moderate medium platy structure; soft, very friable, slightly sticky and slightly plastic; few medium, fine and very fine roots; common fine vesicular pores; moderately alkaline (pH 8.2); abrupt smooth boundary. (Combined thickness of A horizons is 2 to 6 inches)

Bw--6 to 10 inches; pale brown (10YR 6/3) loam, dark brown (10YR 4/3) moist; moderate fine subangular blocky structure, soft friable, slightly sticky and slightly plastic; few medium, fine and very fine roots; few very fine discontinuous pores; moderately alkaline (pH 8.2); abrupt smooth boundary. (4 to 10 inches thick)

**Bqkm**--10 to 16 inches; light yellowish brown (10YR 6/4) continuous strongly cemented duripan, dark brown (10YR 4/3) moist; strong, thick platy structure; very hard, very firm; few fine roots between duripan plates; few very fine discontinuous pores; slightly effervescent; few fine filaments and soft masses of lime; moderately alkaline (pH 8.2); clear smooth boundary. (5 to 18 inches thick)

**Bqk1**--16 to 24 inches; very pale brown (10YR 7/4) loam, brown (10YR 5/3) moist; massive; hard, firm, slightly sticky and slightly plastic; very few fine and very fine roots; few fine discontinuous pores; weak silica and lime cementation; 10 percent durinodes; strongly effervescent; very strongly alkaline (pH 9.2); clear wavy boundary. (0 to 10 inches thick)

**Bqk2**--24 to 35 inches; light gray (10YR 7/2) fine sandy loam, pale brown (10YR 6/3) moist; massive; hard, firm, slightly sticky and slightly plastic; very few fine roots; few fine discontinuous pores; weak silica and lime cementation; 20 percent durinodes; 5 percent pebbles; strongly effervescent; few fine filaments and soft masses of lime; very strongly alkaline (pH 9.2); clear wavy boundary. (0 to 18 inches thick)

**2Bk**--35 to 42 inches; very pale brown (10YR 7/3) very gravelly fine sandy loam, light yellowish brown (10YR 6/4) moist; massive; soft, friable, nonsticky and nonplastic; 50 percent pebbles; strongly effervescent; few fine filaments and soft masses of lime; strongly alkaline (pH 9.0); gradual wavy boundary. (0 to 25 inches thick)

**Bqk3**--42 to 60 inches; very pale brown (10YR 7/3) very gravelly loamy sand, yellowish brown (10YR 5/4) moist; massive; hard, firm, nonsticky and nonplastic; weak silica and lime cementation; moderately alkaline 40 percent pebble size duripan fragments; strongly effervescent; few fine filaments and soft masses of lime; (pH 8.2).

**Type location:** Elko County, Nevada; in an unsectionized area, about 18 miles north of Midas; 41 degrees, 34 minutes, 19 seconds north latitude, 116 degrees, 39 minutes, 26 seconds west longitude.

#### Range in Characteristics

**Soil moisture:** Usually dry; moist during winter and spring, dry summer through fall

**Soil temperature:** 47 to 55 degrees F.

**Depth to base of Bw horizon:** 10 to 15 inches.

**Depth to strongly cemented duripan:** 10 to 20 inches.

**Depth to bedrock:** 60 inches or more.

**Control section:**

Clay content--5 to 15 percent.

Rock fragments--Averages 0 to 25 percent.

#### A horizons:

Value--5 or 6 dry, 3 or 4 moist.

Chroma--2 or 3.

Reaction--Neutral to moderately alkaline.

Other features--Some pedons have few fine soft pockets and films of lime and are violently effervescent.

#### Bw horizon:

Value--5 or 6 dry, 4 or 5 moist.

Chroma--2 through 4.

Texture--Very fine sandy loam, silt loam or loam with thin subhorizons with fine sandy loam in some pedons.

Consistence--Soft to very friable, very friable to friable, nonsticky to slightly sticky and nonplastic to slightly plastic.

Reaction--Neutral to strongly alkaline.

Other features--Some pedons have few fine soft films of lime that are effervescent in pockets.

#### Bqkm horizon:

Structure--Platy or massive.

Consistence--Very hard or extremely hard.

Other features--In some pedons, 2 or more strongly cemented layers are interbedded with weakly cemented material.

Other features--Strongly to violently effervescent.

#### Bqk and Bk horizons:

Clay content--0 to 10 percent.

Rock fragments--Some pedons are gravelly or very gravelly below the duripan.

Reaction--Moderately alkaline through very strongly alkaline.

Cementation--The Bqk horizons have 5 to 45 percent extremely hard, extremely firm, brittle 1/8 to 1/2 inch cylindrical durinodes in a friable or firm matrix or have a continuous brittle matrix.

## Shalake Series

The Shalake series consists of moderately deep, well drained soils that formed in loess and alluvium from mixed volcanic rocks. Shalake soils are on broad summits and sides slopes of fan piedmont remnants. Slopes are 0 to 4 percent. Mean annual precipitation is about 9 inches and the mean annual temperature is about 47 degrees F.

**Taxonomic class:** Coarse-loamy, mixed, mesic Xerollic Durorthids

**Typical pedon:** Shalake very fine sandy loam, 0 to 2 percent slopes, located in an area of map unit 2600. (Colors are for dry soil unless otherwise noted.)

**Al**--0 to 3 inches; pale brown (10YR 6/3) very fine sandy loam, brown (10YR 4/3) moist; moderate thick platy structure parting to strong thin platy; slightly hard, very friable, nonsticky and nonplastic; few fine and very fine roots; few medium and many



fine vesicular pores; mildly alkaline (pH 7.6); abrupt smooth boundary. (2 to 4 inches thick)

A2--3 to 8 inches; pale brown (10YR 6/3) very fine sandy loam, brown (10YR 4/3) moist; moderate thin platy structure; hard, friable, nonsticky and nonplastic; few medium, fine and very fine roots; many very fine vesicular pores; mildly alkaline (pH 7.8); clear smooth boundary. (1 to 5 inches thick)

Bq--8 to 13 inches; pale brown (10YR 6/3) loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; few medium, fine and very fine roots; few very fine vesicular pores; 10 percent pebbles; 15 percent weak silica cemented durinodes; mildly alkaline (pH 7.8); abrupt wavy boundary. (3 to 10 inches thick)

Bqk1--13 to 18 inches; light yellowish brown (10YR 6/4) gravelly loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; hard, firm, brittle, nonsticky and nonplastic; few fine and very fine roots; 15 percent pebbles; 35 percent brittle durinodes; continuous brittle matrix; common fine lime in filaments; strongly effervescent; moderately alkaline (pH 8.0); abrupt wavy boundary. (5 to 12 inches thick)

Bqk2--18 to 25 inches; very pale brown (10YR 8/3) gravelly loam, very pale brown (10YR 7/4) moist; massive; very hard, very firm, brittle, nonsticky and nonplastic; few fine and very fine roots; 30 percent pebbles; 40 percent brittle durinodes; continuous brittle matrix; violently effervescent, lime is disseminated; moderately alkaline (pH 8.0); abrupt wavy boundary. (5 to 10 inches thick)

Bqkm1--25 to 30 inches; very pale brown (10YR 8/3) continuous indurated duripan, very pale brown (10YR 7/3) moist; massive; extremely hard; extremely firm; strongly effervescent; strongly alkaline (pH 8.6); abrupt wavy boundary. (5 to 29 inches thick)

Bqkm2--30 to 60 inches; very pale brown (10YR 8/3) fractured indurated duripan; light gray (10YR 7/2) moist; strong thick and very thick platy; extremely hard, extremely firm; strongly effervescent; strongly alkaline (pH 8.8).

**Type location:** Elko County, Nevada; Owyhee Desert, in an unsectionized area, about 15 miles north of Midas; 41 degrees, 31 minutes, 38 seconds north latitude, 116 degrees, 37 minutes, 44 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Usually dry; moist in winter and spring, dry in summer and early autumn

*Soil temperature:* 47 to 52 degrees F.

*Depth to continuous silica cementation:* 10 to 20 inches.

*Depth to duripan:* 20 to 40 inches.

*Control section:*

Clay content--12 to 18 percent.

Rock fragments--10 to 35 percent, mainly pebbles.

#### A horizons:

Value--3 or 4 moist.

Chroma--2 or 3.

#### Bq, Bqk horizons:

Value--6 through 8 dry, 4 through 7 moist.

Chroma--3 or 4.

Texture--Loam, gravelly loam, gravelly silt loam.

Durinodes--Averages 20 to 50 percent.

## Shalper Series

The Shalper series consists of shallow, well drained soils that formed in residuum and colluvium from welded tuff, rhyolite and other igneous rocks. The Shalper soils are on side slopes and crests or summits of hills and fan piedmonts with a rock core. Slopes are 2 to 50 percent. The mean annual precipitation is about 10 inches and the mean annual temperature is about 44 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, frigid Lithic Argixerolls

**Typical pedon:** Shalper very gravelly loam, 4 to 15 percent slopes, is located in an area of the map unit 625. (Colors are for dry soil unless otherwise noted.) The soil surface is partially covered by 50 percent pebbles and 5 percent cobbles.

Al--0 to 2 inches; brown (10YR 5/3) very gravelly loam, dark brown (10YR 3/3) moist; moderate fine subangular blocky structure; slightly hard, friable, slightly sticky and nonplastic; common very fine, fine and medium roots; few very fine tubular pores; 35 percent pebbles; neutral (pH 6.8); abrupt smooth boundary. (1 to 6 inches thick.)

Bt1--2 to 7 inches; brown (10YR 5/3) very gravelly clay loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, sticky and plastic; common very fine and fine roots; common very fine tubular pores; few thin clay films lining pores; 45 percent pebbles; neutral (pH 7.0); clear wavy boundary. (3 to 5 inches thick.)

Bt2--7 to 11 inches; brown (10YR 5/3) very gravelly clay loam, dark brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, friable, sticky and plastic; common very fine and fine roots; common very fine tubular pores; common thin clay films on faces of peds; 45 percent pebbles; neutral (pH 7.0); (0 to 5 inches thick.)

R--11 inches; hard, fractured rhyolite.

**Type location:** Elko, County, Nevada; approximately 11 miles west of Midas; about 200 feet east and 700 feet south of the northwest corner of section 10, T. 38 N., R. 44 E.; 41 degrees, 11 minutes, 37 seconds north latitude, 117 degrees, 00 minutes, 28 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Moist in winter and spring, dry from July through October for 70 to 100 consecutive days

*Soil temperature:* 45 to 47 degrees F.

*Mollic epipedon thickness:* 4 to 12 inches.

*Control section:*

Clay content--18 to 28 percent.

Rock fragments--35 to 60 percent, mainly pebbles.

Depth to bedrock--4 to 12 inches.

Other features--In some pedons the mollic epipedon includes all of the Bt horizon and is underlain directly by rock.

#### A horizon:

Value--5 or 6 dry, 3 or 4 moist; when the upper 7 inches are mixed, value is less than 5.5 dry and is 3 moist.

Chroma--2 or 3.

#### Bt horizons:

Value--3 or 4 moist.

Chroma--3 or 4 moist.

Texture--Very gravelly loam or very gravelly clay loam.

Clay content--Averages 24 to 35 percent.

Rock fragments--35 to 60 percent, mainly pebbles.

Structure--Weak to moderate subangular blocky and angular blocky.

Other features--Some pedons have thin subhorizons of clay, modified by 35 to 65 percent rock fragments directly over bedrock.

A1--0 to 2 inches; dark grayish brown (10YR 4/2) loam, very dark brown (10YR 2/2) moist; moderate fine granular structure; soft, very friable; many fine roots; many fine tubular pores; 5 percent pebbles; mildly alkaline (pH 7.4); clear smooth boundary. (2 to 10 inches thick)

A1--2 to 9 inches; dark grayish brown (10YR 4/2) loam, very dark brown (10YR 2/2) moist; weak medium subangular structure; soft, very friable, slightly sticky, slightly plastic; many very fine, common fine roots; many very fine tubular pores; 5 percent pebbles; mildly alkaline (pH 7.4); clear smooth boundary. (5 to 10 inches thick)

A3--9 to 21 inches; dark grayish brown (10YR 4/2) loam, very dark brown (10YR 2/2) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky, slightly plastic; many fine and very fine, few medium roots; many very fine tubular pores; 10 percent pebbles; mildly alkaline (pH 7.4); clear wavy boundary. (5 to 12 inches thick)

C--21 to 41 inches; light yellowish brown (10YR 6/4) sandy loam, dark yellowish brown (10YR 4/4) moist; common dark grayish brown (10YR 4/2) stains in ped and on faces of peds, very dark brown (10YR 2/2) moist; moderate medium subangular blocky structure; slightly hard, friable, sticky, plastic; many fine and very fine, few medium roots; many very fine tubular pores; 5 percent pebbles, 5 percent cobbles, 4 percent stones; mildly alkaline (pH 7.4); abrupt wavy boundary. (10 to 25 inches thick)

Cr--41 inches; weathered tuff.

**Type location:** Elko County, Nevada; approximately 10 miles west of Tuscarora; about 1,400 feet south and 1100 feet east of the northwest corner of section 14, T. 40 N., R. 49 E.; 41 degrees, 20 minutes, 55 seconds north latitude, 116 degrees, 24 minutes, 40 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Moist winter and spring, dry late July through early October

*Soil temperature:* 44 to 47 degrees F.

*Mollic epipedon thickness:* 20 to 35 inches.

*Profile reaction:* Neutral to mildly alkaline.

*Depth to paralithic contact:* 40 to 60 inches.

*Control section:*

Textures--Loam, sandy loam or fine sandy loam in the upper part, fine sandy loam, sandy loam or sandy clay loam in the lower part.

Clay content--10 to 18 percent.

Rock fragments--0 to 30 percent, mainly pebbles in any one horizon, but averages 0 to 15 percent.

#### A horizons:

Value--2 through 5 dry, 2 or 3 moist with value of 2 dry common only in the surface subhorizon of some pedons.

## Shively Series

The Shively series consists of deep, well drained soils that formed in colluvium and residuum primarily from tuffaceous sandstone, rhyolite and welded tuff. Shively soils are on concave mountain and hill side slopes with northerly aspects. Slopes are 15 to 75 percent. The mean annual precipitation is about 16 inches and the mean annual temperature is about 43 degrees F.

**Taxonomic class:** Coarse-loamy, mixed, frigid Pachic Haploxerolls

**Typical pedon:** Shively loam, 30 to 50 percent slopes, located in an area of map unit 1810. (Colors are for dry soil unless otherwise noted.) The soil surface is covered with 5 percent pebbles and 2 percent cobbles.



Chroma--1 through 3.

**C horizon:**

Value--5 or 6 dry, 3 through 5 moist.

Chroma--1 through 4.

Structure--Subangular blocky or is massive.

**Cr horizon: (when present above 60 inches):**

Other features--Reflects colors of parent material.

## Short Creek Series

The Short Creek series consists of very deep, well drained soils that formed in alluvium from mixed rock sources. Short Creek soils are on fan piedmont remnants. Slopes are 30 to 50 percent. The mean annual precipitation is about 11 inches and the mean annual temperature is about 44 degrees F.

**Taxonomic class:** Clayey-skeletal, montmorillonitic, frigid Xerollic Haplargids

**Typical pedon:** Short Creek gravelly clay loam, 30 to 50 percent slopes, located in the adjoining Tuscarora Mountain Area, Nevada soil survey. (Colors are for dry soil unless otherwise noted.)

A--0 to 2 inches; light brownish gray (10YR 6/2) gravelly clay loam, very dark grayish brown (10YR 3/2) moist; strong very fine granular structure; slightly hard, friable, sticky and plastic; many very fine, and few fine roots; many very fine tubular pores; 20 percent pebbles; neutral (pH 6.8); abrupt smooth boundary. (1 to 9 inches thick)

Bt1--2 to 8 inches; brown (10YR 5/3) very gravelly clay loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; hard, friable, sticky and plastic; many very fine and fine roots; common very friable, sticky and plastic; many very fine and fine roots; common very fine tubular pores; common moderately thick clay films on peds, and continuous moderately thick clay films lining pores; 40 percent pebbles; neutral (pH 7.0); abrupt wavy boundary. (3 to 10 inches thick)

Bt2--8 to 15 inches; brown (10YR 5/3) gravelly clay, dark yellowish brown (10YR 4/4) moist; weak coarse prismatic structure; hard, firm, very sticky and very plastic; common very fine roots; common very fine tubular pores; continuous moderately thick clay films on peds and lining pores; 25 percent pebbles; neutral (pH 7.0); gradual smooth boundary. (5 to 14 inches thick)

Bt3--15 to 23 inches; brown (10YR 5/3) very gravelly clay, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; hard, firm, very sticky and very plastic; few very fine roots; common very fine tubular pores; continuous moderately thick clay films on peds and in pores; 45 percent pebbles; neutral (pH 7.2); gradual wavy boundary. (6 to 21 inches thick)

Bt4--23 to 50 inches; brown (10YR 5/3) extremely gravelly sandy clay, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; hard, friable, very sticky and plastic; few very fine roots; common very fine tubular pores; continuous thick clay films bridging and coating sand grains and pebbles; 70 percent pebbles; moderately alkaline (pH 8.0); gradual irregular boundary; (0 to 30 inches thick)

Btk--50 to 60 inches; pale brown (10YR 6/3) extremely gravelly sandy clay, dark yellowish brown (10YR 4/4) moist, few medium and coarse dark reddish brown (5YR 3/3), strong brown (7.5YR 5/8), dark brown (7.5YR 3/2), and black (10YR 2/1) mottles; massive; hard, friable, very sticky and plastic; few very fine roots; many fine interstitial, and few fine tubular pores; many thin and few moderately thick clay films in pores, common moderately thick clay films bridging sand grains and coating pebbles; 70 percent pebbles; slightly effervescent; moderately alkaline (pH 8.3).

**Type location:** Elko County, Nevada; approximately 3 miles southwest of the Stampede Ranch of Maggie Creek; about 2,650 feet east of the northwest corner of section 16, T. 37 N., R. 52 E.; 41 degrees, 06 minutes, 19 seconds north latitude, 116 degrees, 08 minutes, 06 seconds west longitude.

### Range in Characteristics

*Soil moisture:* Usually dry; moist in winter and spring, dry June through October

*Soil temperature:* 45 to 47 degrees F.

*Depth to lime:* 30 to 54 inches.

*Depth to base of argillic horizon:* 30 to 60 inches.

*Control section:*

*Profile reaction:* Neutral to strongly alkaline increasing with depth.

Clay content--40 to 50 percent.

Rock fragments--Averages 35 to 50 percent, mainly pebbles.

**A horizon:**

Value--5 to 6 dry, 3 or 4 moist.

Chroma--2 or 3.

Other features--Thickness of this horizon with dry value of 5 is less than 1/3 of solum.

**Upper Bt horizons:**

Value--4 through 6 dry or moist.

Chroma--2 through 4.

Rock fragments--Averages 35 to 60 percent, mainly pebbles.

Structure--Weak to moderate, fine to coarse prismatic, weak to strong subangular blocky.

Consistence--Hard or very hard dry.

Other features--Upper boundary is abrupt or clear and if abrupt, it has less than 15 percent clay increase between the A and Bt subhorizons.

**Lower Bt or Btk horizons:**

Texture--Sandy clay loam, clay loam, sandy clay.  
Clay content--30 to 40 percent.  
Rock fragments--60 to 70 percent, mainly pebbles.

## Skull Creek Series

The Skull Creek series consists of moderately deep, well drained soils that formed in loess high in volcanic ash over mixed alluvium. The Skull Creek soils are on fan piedmonts and fan piedmonts remnants. Slopes are 0 to 8 percent. The mean annual precipitation is about 10 inches and the mean annual temperature is about 47 degrees F.

**Taxonomic class:** Coarse-loamy, mixed, mesic Xerollic Durorthids

**Typical pedon:** Skull Creek, very fine sandy loam, 2 to 8 percent slopes, located in an area of map unit 1210. (Colors are for dry soil unless otherwise noted.)

A1--0 to 2 inches; pale brown (10YR 6/3) very fine sandy loam, dark brown (10YR 4/3) moist; strong very thin platy structure; soft, very friable; many very fine and few fine roots; many very fine vesicular pores; mildly alkaline (pH 7.6); clear smooth boundary. (1 to 8 inches thick)

A2--2 to 6 inches; pale brown (10YR 6/3) very fine sandy loam, dark brown (10YR 4/3) moist; moderate very thin platy structure; slightly hard, friable; common very fine and few fine and medium roots; common very fine vesicular and few very fine tubular pores; mildly alkaline (pH 7.8); clear smooth boundary. (1 to 5 inches thick)

Bw1--6 to 11 inches; light yellowish brown (10YR 6/4) loam, dark yellowish brown (10YR 4/4) moist; moderate fine and medium subangular blocky structure; slightly hard, friable, slightly sticky, slightly plastic; common very fine and fine roots; common very fine tubular pores; 5 percent pebbles; moderately alkaline (pH 8.0); clear smooth boundary. (0 to 5 inches thick)

Bw2--11 to 15 inches; very pale brown (10YR 7/3) gravelly loam, dark brown (10YR 4/3) moist; weak fine subangular blocky; slightly hard, friable, slightly sticky, slightly plastic; common very fine and fine roots; common very fine tubular pores; 15 percent pebbles; moderately alkaline (pH 8.2). (3 to 8 inches thick)

Bqk1--15 to 23 inches; light gray (10YR 7/2) gravelly sandy loam, dark brown (10YR 4/3) moist; massive; hard, friable, slightly sticky and slightly plastic; common very fine roots; few fine tubular pores; 15

percent 5 to 15 millimeter durinodes; effervescent with common fine lime filaments; 25 percent pebbles; moderately alkaline (pH 8.4); clear smooth boundary. (5 to 12 inches thick)

Bqk2--23 to 34 inches; very pale brown (10YR 7/3) gravelly sandy loam, dark brown (10YR 4/3) moist; massive; hard, friable; few very fine roots, few fine tubular pores; 25 percent 5 to 15 millimeter durinodes; strongly effervescent with common medium lime filaments; 20 percent pebbles; moderately alkaline (pH 8.4); abrupt wavy boundary. (0 to 11 inches thick)

Bqkm--34 inches; white (10YR 8/2) indurated duripan; strongly effervescent.

**Type location:** Elko County, Nevada; approximately 3.5 miles south of Rock Creek Ranch, about 1,600 feet north and 1,600 feet west of the southeast corner of section 6, T. 36 N., R. 47 E.; 41 degrees, 10 minutes, 04 seconds north latitude, 116 degrees, 42 minutes, 25 seconds west longitude.

### Range in Characteristics

*Soil moisture:* Usually dry; moist in winter and spring, dry June through October

*Soil temperature:* 47 to 52 degrees F.

*Depth to duripan:* 20 to 40 inches.

*Control section:*

Clay content--8 to 18 percent.

### A horizons:

Value--6 or 7 dry, 3 or 4 moist.

Chroma--2 or 3.

Reaction--Mildly alkaline or moderately alkaline.

### Bw horizons:

Value--6 or 7 dry, 3 or 4 moist.

Chroma--3 or 4.

Texture--Loam, sandy loam, gravelly loam or gravelly sandy loam.

Rock fragments--0 to 30 percent, mainly pebbles.

Structure--Weak or moderate, fine or medium subangular blocky or it is massive.

Reaction--Moderately alkaline or strongly alkaline.

### Bqk or Bqkm horizons:

Value--5 through 7 dry, 3 or 4 moist.

Chroma--3 through 6.

Durinodes--0 to 30 percent.

Reaction--Moderately alkaline or strongly alkaline.

## Snowmore Series

The Snowmore series consists of moderately deep to a duripan, well drained soils that formed in loess over residuum from basalt and rhyolite. Snowmore soils are on plateaus, calderas, structural benches and hills. Slopes are 0 to 30 percent. The mean annual



precipitation is about 9 inches and the mean annual temperature is about 47 degrees F.

**Taxonomic class:** Fine-loamy, mixed, mesic Xerollic Durargids

**Typical pedon:** Snowmore cobbly fine sandy loam, 2 to 4 percent slopes, located in an area of map unit 2780. (Colors are for dry soil unless otherwise noted.) The soil surface is partially covered with approximately 10 percent pebbles and 15 percent cobbles.

A1--0 to 2 inches; light brownish gray (10YR 6/2) cobbly fine sandy loam, dark grayish brown (10YR 4/2) moist; weak fine platy structure parting to weak fine granular; slightly hard, very friable, nonsticky and nonplastic; common very fine roots; many fine and very fine vesicular pores; 10 percent pebbles, 15 percent cobbles, 1 percent stones; mildly alkaline (pH 7.6); abrupt smooth boundary. (2 to 4 inches thick)

A2--2 to 4 inches; light brownish gray (10YR 6/2) cobbly fine sandy loam, dark brown (10YR 4/3) moist; moderate fine platy structure; slightly hard, very friable, nonsticky and nonplastic; few medium and many very fine roots; common very fine vesicular pores; 10 percent pebbles, 10 percent cobbles; mildly alkaline (pH 7.8); abrupt smooth boundary. (0 to 4 inches thick)

Bt1--4 to 8 inches; light brownish gray (10YR 6/2) loam, dark brown (10YR 4/3) moist; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky and plastic; common fine and very fine roots; common fine tubular and interstitial pores; few thin clay films lining pores; 10 percent pebbles; mildly alkaline (pH 7.8); abrupt wavy boundary. (2 to 9 inches thick)

Bt2--8 to 13 inches; pale brown (10YR 6/3) loam, dark brown (10YR 4/3) moist; moderate medium subangular blocky structure; hard, friable, sticky and plastic; few medium and coarse, common fine and very fine roots; few very fine interstitial pores; common moderately thick clay films on faces of peds and lining pores; 5 percent pebbles; mildly alkaline (pH 7.0); abrupt wavy boundary. (3 to 8 inches thick)

Bq--13 to 16 inches; light yellowish brown (10YR 6/4) loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; hard, firm, sticky and plastic; few very fine roots; few very fine interstitial pores; continuous weak silica cementation; 15 percent brittle durinodes; 5 percent pebbles; moderately alkaline (pH 8.4); abrupt wavy boundary. (0 to 8 inches thick)

Bqk--16 to 22 inches; very pale brown (10YR 7/4) gravelly clay loam, dark yellowish brown (10YR 4/4) moist; massive; hard, firm and brittle, slightly sticky and slightly plastic; few very fine roots; continuous brittle matrix; 20 percent brittle durinodes; 20

percent pebbles, 5 percent cobbles; common fine lime in soft masses and filaments; strongly effervescent; strongly alkaline (pH 8.8); abrupt wavy boundary. (0 to 20 inches thick)  
Bqkm--22 to 28 inches; white (10YR 8/2) indurated duripan, dark grayish brown (10YR 4/2) moist; massive; extremely hard, extremely firm; violently effervescent; strongly alkaline (pH 8.8); abrupt wavy boundary. (3 to 10 inches thick)  
R--28 inches; rhyolite bedrock.

**Type location:** Elko County, Nevada; in an unsectionized area of the Owyhee Desert, about 23 miles northwest of Midas; 41 degrees, 31 minutes, 25 seconds north latitude, 116 degrees, 58 minutes, 30 seconds west longitude.

### Range in Characteristics

*Soil moisture:* Usually dry; moist in winter and spring, dry in June through October

*Soil temperature:* 47 to 52 degrees F.

*Depth to Bq horizons:* 11 to 18 inches.

*Depth to duripan:* 20 to 34 inches.

*Depth to bedrock:* 21 to 40 inches.

*Control section:*

Clay content--20 to 35 percent.

Rock fragments--0 to 15 percent, mainly pebbles.

### A horizons:

Value--5 or 6 dry, 3 or 4 moist, the upper 7 inches after mixing does not have both value of 5 dry, and 3 moist.

Chroma--2 or 3.

Reaction--Neutral or mildly alkaline.

### Bt horizons:

Value--5 or 6 dry.

Chroma--2 through 4.

Texture--Loam, silt loam, clay loam or sandy clay loam.

Consistence--Slightly sticky or sticky and slightly plastic or plastic, wet.

Reaction--Mildly or moderately alkaline.

### Bq, Bqk horizons:

Value--6 or 7 dry, 4 or 5 moist.

Chroma--3 or 4

Texture--loam, gravelly or cobbly fine sandy loam, gravelly loam or gravelly clay loam.

Reaction--moderately alkaline or strongly alkaline.

Effervescence--noneffervescent through strongly effervescent.

### Bqkm horizon:

Value--7 or 8 dry, 4 or 5 moist.

Chroma--2 or 3.

## Sodhouse Series

The Sodhouse series consists of shallow over a duripan, well-drained soils that formed in alluvium from mixed rock sources with some influence from loess and volcanic ash. These soils are on dissected fan piedmont remnants and plateaus. Slopes are 0 to 15 percent. The mean annual precipitation is about 7 inches and the mean annual temperature is about 48 degrees F.

**Taxonomic class:** Loamy, mixed, mesic, shallow Typic Durorthids

**Typical pedon:** Sodhouse silt loam, 0 to 2 percent slopes, is located in an area of map unit 3020. (Colors are for dry soil unless otherwise noted.) The soil surface is partially covered by 10 percent pebbles.

**A--**0 to 6 inches; light gray (10YR 7/2) silt loam, brown (10YR 5/3) moist; strong very thick platy structure parting to weak thin platy; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; many very fine and fine vesicular pores; 5 percent pebbles, moderately alkaline (pH 8.2); abrupt smooth boundary. (1 to 6 inches thick)

**Bw--**6 to 10 inches; very pale brown (10YR 7/3) silt loam, yellowish brown (10YR 5/4) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine, fine, and few medium roots; many very fine and fine tubular pores; 5 percent pebbles; slightly effervescent; moderately alkaline (pH 8.0); clear smooth boundary. (3 to 7 inches thick)

**Bq--**10 to 19 inches; light yellowish brown (10YR 6/4) loam, yellowish brown (10YR 5/4) moist; massive; hard, firm, slightly sticky and slightly plastic; common fine and few medium roots; few fine interstitial pores; 5 percent pebbles; 20 percent durinodes in a weakly brittle matrix; moderately alkaline (pH 8.0); abrupt smooth boundary. (0 to 9 inches thick)

**2Bqkm--**19 to 25 inches; white (10YR 8/2) indurated duripan, very pale brown (10YR 7/3) moist; massive; extremely hard, extremely firm; 1 to 2 millimeters continuous laminar cap; violently effervescent; clear wavy boundary. (6 to 24 inches thick)

**2Bqk--**25 to 61 inches; very pale brown (10YR 7/4) gravelly sandy loam, yellowish brown (10YR 5/4) moist; massive; hard, firm, nonsticky and nonplastic; many fine interstitial pores; 30 percent pebbles; discontinuous brittle matrix; violently effervescent; strongly alkaline (pH 8.6).

**Type location:** Elko County, Nevada; in the Owyhee Desert, in an unsectionized area, about 35 miles northwest of Wilson Reservoir; 41 degrees, 53 minutes, 47 seconds north latitude, 116 degrees, 59 minutes, 18 seconds west longitude.

## Range in Characteristics

**Soil moisture:** Usually dry; moist for short periods in winter and spring, dry from June through November

**Soil temperature:** 47 to 53 degrees F.

**Depth to indurated duripan:** 14 to 20 inches.

**Depth to 2Bqk horizon:** 25 to 44 inches.

**Reaction:** Moderately alkaline or strongly alkaline usually increasing with depth.

**Other features:** Durinodes and lime accumulations are common in subhorizons immediately above the duripan of some pedons.

**Control section:**

Clay content--8 to 15 percent.

### A horizon:

Hue--10YR or 2.5Y.

Value--6 or 7 dry, 4 or 5 moist.

Chroma--2 or 3.

Other features--Normally noneffervescent, but some pedons are slightly effervescent due to lime recharge from dust.

### Bw horizon:

Hue--10YR or 2.5Y.

Value--6 or 7 dry, 4 or 5 moist.

Chroma--3 or 4.

Texture--Very fine sandy loam, fine sandy loam, silt loam, loam or gravelly loam.

Consistence--Slightly hard or hard dry, friable or firm moist.

Rock fragments--5 to 35 percent, mainly pebbles.

### 2Bqkm horizon:

Hue--10YR or 2.5Y.

Value--6 through 8 dry, 4 through 7 moist.

Chroma--2 through 4.

Structure--Platy or is massive.

### 2Bqk horizons:

Hue--10YR or 2.5Y.

Value--6 or 7 dry, 4 or 5 moist.

Chroma--3 or 4.

Texture--Extremely gravelly sandy loam, gravelly loam, gravelly sandy loam, very gravelly loamy sand or very gravelly loamy coarse sand.

Consistence--Slightly hard to very hard dry; friable to very firm, moist.

## Sonoma Series

The Sonoma series consists of very deep, poorly drained soils that formed in silty alluvium from mixed rocks with a component of volcanic ash. Sonoma soils are on flood plains, stream terraces, and basin floor remnants. Slopes are 0 to 2 percent. The mean annual precipitation is about 7 inches and the mean annual temperature is about 50 degrees F.



**Taxonomic class:** Fine-silty, mixed (calcareous), mesic  
Aeric Fluvaquents

**Typical pedon:** Sonoma silt loam, 0 to 2 percent  
slopes, is located in an area of map unit 161.  
(Colors are for dry soil unless otherwise noted.)

A1--0 to 3 inches; light gray (2.5Y 7/2) silt loam, dark  
grayish brown (2.5Y 4/2) moist; strong thick platy  
structure; slightly hard, very friable, very sticky and  
slightly plastic; common very fine roots; common  
very fine interstitial pores; strongly effervescent;  
strongly alkaline (pH 8.6); abrupt smooth boundary.  
(2 to 10 inches thick)

A2--3 to 7 inches; light gray (10YR 7/2) silt loam,  
brown (10YR 4/3) moist; moderate thin platy  
structure; soft, very friable, slightly sticky and  
slightly plastic; common very fine and fine roots;  
few very fine interstitial pores; strongly  
effervescent; moderately alkaline (pH 8.4); clear  
smooth boundary. (0 to 4 inches thick)

AC--7 to 12 inches; light gray (2.5Y 7/2) silt loam,  
very dark grayish brown (10YR 3/2) moist; weak  
thin platy structure; soft, very friable, sticky and  
slightly plastic; common very fine, fine and medium  
roots; common very fine and fine interstitial pores;  
strongly effervescent; moderately alkaline (pH 8.4);  
clear smooth boundary. (3 to 12 inches thick)

C1--12 to 26 inches; light gray (2.5Y 7/1) silty clay  
loam, dark grayish brown (2.5Y 4/2) moist;  
common fine prominent dark yellowish brown  
(10YR 4/4) moist mottles; moderate medium  
subangular blocky structure; slightly hard, very  
friable, very sticky and plastic; common very fine  
and fine roots; many very fine tubular and interstitial  
pores; strongly effervescent; strongly alkaline (pH  
8.6); clear smooth boundary. (5 to 14 inches thick)

C2--26 to 36 inches; light gray (10YR 7/2) silt loam,  
dark grayish brown (10YR 4/2) moist; common fine  
prominent dark yellowish brown (10YR 4/4) moist  
mottles; moderate medium subangular blocky  
structure; slightly hard, friable sticky and plastic;  
common very fine roots; few very fine interstitial  
pores; strongly effervescent; strongly alkaline (pH  
8.6); clear smooth boundary. (8 to 25 inches thick)

C3--36 to 44 inches; light gray (10YR 7/2) silt loam,  
grayish brown (2.5Y 5/2) moist; common fine  
prominent dark yellowish brown (10YR 4/4) moist;  
and brown (10YR 5/3) moist mottles; massive;  
hard, friable, slightly sticky and slightly plastic; few  
very fine roots; few very fine interstitial pores;  
strongly effervescent; strongly alkaline (pH 8.6);  
clear smooth boundary. (0 to 10 inches thick)

C4--44 to 54 inches; light gray (10YR 7/2) silty clay  
loam, dark grayish brown (10YR 4/2) moist; few  
fine distinct brown (10YR 4/3) moist mottles, moist;  
weak very thin platy structure; hard, friable, very  
sticky and very plastic; few very fine interstitial  
pores; strongly effervescent; strongly alkaline (pH  
8.6); clear smooth boundary. (0 to 16 inches thick)

C5--54 to 60 inches; light gray (10YR 7/2) silty clay  
loam, dark grayish brown (10YR 4/2) moist; few  
fine distinct strong brown (7.5YR 5/6) moist  
mottles; massive; very hard, firm, very sticky and  
very plastic; few very fine interstitial pores; strongly  
effervescent; strongly alkaline (pH 8.6).

**Type location:** Elko County, Nevada; approximately 4  
miles south of Rock Creek; about 900 feet east and  
600 feet south of the northwest corner of section  
7, T. 36 N., R. 47 E.; 41 degrees, 01 minutes, 04  
seconds north latitude, 116 degrees, 43 minutes,  
02 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Saturated during spring and early  
summer with the water table at depths below 40  
inches during the remainder of the year, unless  
drained

*Soil temperature:* 49 to 53 degrees F.

*Carbonates:* Calcium carbonate equivalent is 3 to 12  
percent throughout the profile and is strongly or  
violently effervescent.

*Control section:*

Clay content--25 to 35 percent.

Texture--Stratified silt loam to silty clay loam with  
strata of clay or silty clay in some pedons.

#### A horizons:

Hue--2.5Y or 10YR.

Value--6 or 7 dry, 3 through 5 moist.

Chroma--1 or 2.

Reaction--Moderately alkaline through very strongly  
alkaline; buried A horizons are moderately  
alkaline or strongly alkaline.

#### C horizons:

Hue--10YR to 5Y.

Value--6 through 8 dry, 3 through 6 moist.

Chroma--1 or 2. Subhorizons in some pedons have  
chroma of 3 or 4.

Structure--Platy, prismatic, granular, subangular  
blocky or the horizon is massive.

Reaction--Moderately alkaline through very strongly  
alkaline.

Other features--Fresh-water crustacean shells and  
1/4 to 1/2 inch diameter lime concretions in most  
pedons.

### Soonaker Series

The Soonaker series consists of moderately deep,  
well drained soils that formed in tuffaceous sandstone,  
rhyolitic tuff. The Soonaker soils are on hills. Slopes  
are 2 to 8 percent. The mean annual precipitation is  
about 14 inches and the mean annual temperature is  
about 44 degrees F.

**Taxonomic class:** Fine-loamy, mixed, frigid Mollic Haploxeralfs

**Typical pedon:** Soonaker fine sandy loam, 2 to 8 percent slopes, located in an area of map unit 210. (Colors are for dry soil unless otherwise noted.)

A--0 to 3 inches; light brownish gray (10YR 6/2) fine sandy loam, very dark grayish brown (10YR 3/2) moist; moderate thick platy structure; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; many very fine tubular pores; neutral (pH 6.8); abrupt smooth boundary. (2 to 8 inches thick)

BA--3 to 7 inches; pale brown (10YR 6/3) loam, dark brown (10YR 3/3) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine and few medium roots; common very fine tubular pores; neutral (pH 6.8); clear smooth boundary. (3 to 9 inches thick)

Bt1--7 to 12 inches; pale brown (10YR 6/3) loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine tubular pores; common thin clay films bridging sand grains; neutral (pH 7.2); clear smooth boundary. (4 to 9 inches thick)

Bt2--12 to 16 inches; pale brown (10YR 6/3) loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; few very fine through coarse roots; few very fine tubular pores; many moderately thick clay films bridging sand grains and lining pores; neutral (pH 7.2); clear smooth boundary. (3 to 10 inches thick)

BC--16 to 24 inches; pale brown (10YR 6/3) gravelly sandy loam, brown (10YR 4/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine through coarse roots; few very fine tubular pores; 25 percent pebbles; mildly alkaline (pH 7.4). (6 to 12 inches thick)

R--24 inches; fractured tuffaceous sandstone with some pockets of weathered tuff.

**Type location:** Elko County, Nevada; approximately 18 miles southwest of Owyhee; about 50 feet south and 1,000 feet west of the southeast corner of section 36, T. 46 N., R. 50 E.; 41 degrees, 50 minutes, 09 seconds north latitude, 116 degrees, 18 minutes, 30 seconds west longitude.

#### Range in Characteristics

**Soil moisture:** Moist in winter and spring, dry July through October

**Soil temperature:** 43 to 47 degrees F.

**Depth to bedrock:** 20 to 40 inches.

**Profile reaction:** Neutral or mildly alkaline.

**Other features:** Some pedons have a Bw horizons directly above the Bt horizon.

**Control section:**

Clay content--18 to 25 percent.

**A horizon:**

Chroma--2 or 3 moist or dry.

**Bt horizons:**

Chroma--3 or 4 moist or dry.

Rock fragments--0 to 15 percent, mainly pebbles.

**BC horizon:**

Value--6 or 7 dry.

Chroma--3 or 4 moist or dry.

Rock fragments--15 to 35 percent, mainly pebbles.

## Soughe Series

The Soughe series consists of shallow, well drained soils that formed in residuum and colluvium from various rocks. Soughe soils are on rock core areas of fan piedmont remnant side slopes, hills, plateaus and mountains. Slopes are 2 to 75 percent. Mean annual precipitation is about 9 inches and the mean annual temperature is about 47 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic Lithic Xerollic Haplargids

**Typical pedon:** Soughe very cobbly loam, 15 to 30 percent slopes, is located in an area of map unit 623. (Colors are for dry soil unless otherwise noted.) The soil surface is partially covered with 20 percent pebbles and 30 percent cobbles.

A--0 to 3 inches; pale brown (10YR 6/3) very cobbly loam, dark brown (10YR 4/3) moist; weak thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine vesicular pores; 20 percent pebbles, 30 percent cobbles; mildly alkaline (pH 7.6); clear smooth boundary. (3 to 10 inches thick)

A2--3 to 10 inches; pale brown (10YR 6/3) very gravelly loam, dark brown (10YR 4/3) moist; weak fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine tubular pores; 30 percent pebbles, 15 percent cobbles; mildly alkaline (pH 7.8); clear smooth boundary. (0 to 10 inches thick)

Bt--10 to 19 inches; pale brown (10YR 6/3) very gravelly clay loam, dark yellowish brown (10YR 4/4) moist; moderate fine subangular blocky structure; slightly hard, friable, sticky and plastic; few very fine and fine roots; common very fine tubular pores; common thin clay films on faces of peds; 40 percent pebbles, 10 percent cobbles; moderately



alkaline (pH 8.2); abrupt wavy boundary. (3 to 10 inches thick)

R--19 inches; hard andesite bedrock.

**Type location:** Elko County, Nevada; approximately 7 miles southwest of Midas; about 1,500 feet west and 750 feet north of the southeast corner of section 7, T. 37 N., R. 45 E.; 41 degrees, 5 minutes, 39 seconds north latitude, 116 degrees, 56 minutes, 17 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Usually dry; moist in winter and spring, dry mid June through October

*Soil temperature:* 47 to 50 degrees.

*Depth to bedrock:* 10 to 20 inches.

*Reaction:* Neutral through moderately alkaline.

*Control section:*

Clay content--25 to 35 percent.

Rock fragments--35 to 60 percent, mainly pebbles with 0 to 10 percent cobbles.

#### A horizons:

Value--5 or 6 dry, 3 or 4 moist.

#### Bt horizon:

Value--4 through 6 dry, 3 or 4 moist.

Chroma--3 or 4.

Texture--Very gravelly clay loam, very gravelly sandy clay loam, or very gravelly loam.

Structure--Weak to strong, very fine to very coarse subangular blocky or moderate to strong, medium angular blocky.

Consistence--Soft to hard, dry; very friable or friable, moist; sticky or very sticky and plastic or very plastic, wet.

## Stampede Series

The Stampede series consists of well drained soils that are moderately deep to an indurated duripan. These soils formed in alluvium from tuff and other mixed rock sources. Stampede soils are on fan piedmont remnants and mountain valley fans. Slopes are 2 to 15 percent. The mean annual precipitation is about 12 inches and the mean annual temperature is about 43 degrees F.

**Taxonomic class:** Fine, montmorillonitic, frigid Aridic Durixerolls

**Typical pedon:** Stampede silt loam, 2 to 8 percent slopes, is located in an area of map unit 464. (Colors are for dry soils unless otherwise noted.)

A1--0 to 5 inches; grayish brown (10YR 5/2) silt loam, very dark grayish brown (10YR 3/2) moist; weak thick platy structure parting to moderate very thin platy; hard, very friable, slightly sticky and slightly

plastic; many very fine roots; many very fine interstitial pores; 5 percent pebbles; neutral (pH 6.8); abrupt smooth boundary. (2 to 5 inches thick) A2--5 to 12 inches; dark grayish brown (10YR 4/2) silt loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure; hard, very friable, sticky and plastic; common very fine and medium roots; many very fine interstitial pores; 5 percent pebbles; neutral (pH 7.3); abrupt smooth boundary. (3 to 8 inches thick)

Bt1--12 to 16 inches; pale brown (10YR 6/3) silt loam, very dark grayish brown (10YR 3/2) moist; moderate medium prismatic structure; slightly hard, friable, very sticky and very plastic; common very fine and medium expd roots; few very fine interstitial pores; few moderately thick clay films on faces of peds; 5 percent pebbles; mildly alkaline (pH 7.8); clear smooth boundary. (5 to 13 inches thick)

Bt2--16 to 37 inches; yellowish brown (10YR 5/4) silty clay, dark yellowish brown (10YR 4/4) moist; strong medium prismatic structure; very hard, firm, very sticky and very plastic; common very fine, few fine and medium roots; continuous pressure faces; 5 percent pebbles; mildly alkaline (pH 7.8); clear wavy boundary. (0 to 13 inches thick)

2Bqkm--37 to 60 inches; very pale brown (10YR 8/3) indurated duripan, brown (10YR 5/3) moist; 1/2 to 2 millimeter thick continuous laminar caps throughout the horizons;; moderately alkaline (pH 8.0).

**Type location:** Elko County, Nevada; approximately 25 miles southeast of Wilson Reservoir; about 1,300 feet west of the northeast corner of section 7, T. 43 N., R. 51 E.; 41 degrees, 38 minutes, 50 seconds north latitude, 116 degrees, 17 minutes, 05 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Moist in winter and spring; dry July to October

*Soil temperature:* 44 to 47 degrees F.

*Depth to duripan:* 20 to 37 inches.

*Mollic epipedon thickness:* 7 to 13 inches, may include upper of Bt horizon of some pedons.

*Control section:*

Clay content--40 to 55 percent.

Rock fragments--0 to 10 percent pebbles.

#### A horizons:

Value--4 or 5 dry, 2 or 3 moist. (6 dry and 4 moist common in the lower subhorizon).

Chroma--2 or 3.

Reaction--Slightly acid or neutral.

#### Bt horizons:

Hue--10YR or 7.5YR.

Value--4 through 6 dry, 3 through 5 moist.

Chroma--2 through 4.

Rock fragments--Up to 15 percent in any one horizon.

Structure--Moderate or strong medium or coarse prismatic or fine to coarse subangular or angular blocky.

Reaction--Neutral to moderately alkaline.

#### **Bqkm horizon:**

Reaction--Mildly alkaline or moderately alkaline.

Other features--Noneffervescent to strongly effervescent in the matrix.

## **Sumine Series**

The Sumine series consists of moderately deep, well drained soils that formed in residuum and colluvium from mixed rocks. The Sumine soils are on hills, mountains and plateau side slopes. Slopes are 9 to 75 percent. The mean annual precipitation is about 12 inches and the mean annual temperature is about 42 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, frigid Aridic Argixerolls

**Typical pedon:** Sumine very gravelly loam, 15 to 50 percent slopes, is located in an area of map unit 570. (Colors are for dry soil unless otherwise noted.) The soil surface is partially covered by 60 percent pebbles.

A1--0 to 4 inches; brown (10YR 5/3) very gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine roots; common very fine tubular pores; 45 percent pebbles; neutral (pH 7.2); clear wavy boundary. (2 to 5 inches thick)

Bt1--4 to 10 inches; brown (10YR 5/3) very gravelly loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and few coarse roots; many very fine and common fine pores; 45 percent pebbles; few thin clay films lining tubular pores and on faces of peds; neutral (pH 7.3); clear wavy boundary. (3 to 15 inches thick)

Bt2--10 to 21 inches; yellowish brown (10YR 5/4) very gravelly clay loam, brown (10YR 4/3) moist; strong medium subangular block structure; hard, firm, sticky and plastic; common very fine and few fine roots; many very fine and common fine tubular pores; 45 percent pebbles, 5 percent cobbles; common moderately thick clay films lining pores and on faces of peds; neutral (pH 7.2); clear wavy boundary. (5 to 15 inches thick)

Bt3--21 to 29 inches; light yellowish brown (10YR 6/4) very gravelly clay loam, dark yellowish brown (10YR

4/4) moist; moderate medium subangular blocky structure; hard, friable, sticky and plastic; common very fine and few fine roots; many very fine and few fine tubular pores; 45 percent pebbles and 5 percent cobbles; common moderately thick clay films lining pores and on faces of peds; neutral (pH 7.2); abrupt wavy boundary. (0 to 12 inches thick) R--29 inches; hard, unweathered bedrock.

**Type location:** Elko County, Nevada; approximately 6 miles west of Tuscarora, about 2,500 feet west and 1,500 feet north of the southeast corner of section 33, T. 40 N., R. 50 E.; 41 degrees, 18 minutes, 02 seconds north latitude, 116 degrees, 14 minutes, 22 seconds west longitude.

### **Range in Characteristics**

*Soil moisture:* Usually dry; moist in the winter and spring, dry from early July through mid October

*Soil temperature:* 42 to 47 degrees F.

*Mollic epipedon thickness:* 8 to 17 inches thick.

*Depth to bedrock (lithic contact):* 20 to 40 inches.

*Combined thickness of the A and Bt horizons:* 20 to 40 inches.

*Profile reaction:* Neutral or mildly alkaline.

*Control section:*

Clay content--25 to 35 percent, when mixed.

Rock fragments--35 to 60 percent, when averaged.

#### **A horizon:**

Value--4 or 5 dry, 2 or 3 moist.

Chroma--2 or 3.

#### **Bt horizons:**

Hue--10YR or 7.5YR.

Value--4 through 6 dry, 2 through 4 moist.

Chroma--2 through 4.

Texture--Dominantly clay loam, but some pedons have thin horizons of loam or clay.

Structure--Weak or moderate, very fine to medium angular or subangular blocky structure. The lower Bt horizons may be massive.

## **Susie Creek Series**

The Susie Creek series consists of deep, well drained soils that formed in residuum from weakly consolidated tuff and andesite with some influence from loess and volcanic ash. Susie Creek soils are on plateaus, foothills and fan piedmont remnants with a rock core. Slopes are 2 to 15 percent. The mean annual precipitation is about 11 inches and the mean annual temperature is about 44 degrees F.

**Taxonomic class:** Fine, montmorillonitic, frigid Durargidic Argixerolls



**Typical pedon:** Susie Creek loam, 4 to 15 percent slopes, is located an area of map unit 3100. (Colors are for dry soil unless other noted. The soil surface is covered by 5 percent pebbles.

- A1--0 to 3 inches; brown (10YR 5/3) loam, very dark brown (10YR 2/2) moist; moderate medium platy structure; slightly hard, friable, sticky, plastic; common very fine roots; few fine and very fine tubular pores; 5 percent pebbles; neutral (pH 7.2); clear smooth boundary. (1 to 4 inches thick)
- A2--3 to 10 inches; brown (10YR 5/3) clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure parting to moderate fine granular; slightly hard, friable, sticky, plastic; few fine and very fine roots; common very fine tubular pores; 5 percent pebbles; neutral (pH 7.2); clear smooth boundary. (4 to 9 inches thick)
- Bt1--10 to 15 inches; pale brown (10YR 6/3) clay loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; hard, firm, sticky, plastic; few fine and very fine roots; few fine tubular pores; common thin clay films on faces of peds and lining pores; 10 percent pebbles; neutral (pH 7.0); clear smooth boundary. (5 to 12 inches thick)
- Bt2--15 to 24 inches; yellowish brown (10YR 5/4) clay, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; very hard, very firm, very sticky, very plastic; few very fine roots; common moderately thick clay films on faces of ped strongly effervescent; 5 percent pebbles; mildly alkaline (pH 7.8); clear smooth boundary. (4 to 11 inches thick)
- Btk--24 to 30 inches; yellowish brown (10YR 5/4) clay, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; very hard, very firm, very sticky, very plastic; few very fine roots; common moderately thick clay films on faces of peds; strongly effervescent; few fine soft masses of lime; 5 percent pebbles; mildly alkaline (pH 7.8); clear smooth boundary. (0 to 8 inches thick)
- Bqk1--30 to 40 inches; very pale brown (10YR 7/3) loam, yellowish brown (10YR 5/4) moist; massive; very hard, firm, slightly sticky, plastic; weak discontinuous silica and lime cementation; 20 percent brittle durinodes; violently effervescent; 5 percent pebbles, 5 percent cobbles; continuous brittle matrix; moderately alkaline (pH 8.0); gradual wavy boundary. (5 to 20 inches thick)
- Bqk2--40 to 60 inches; pale brown (10YR 6/3) loam, dark brown (10YR 4/3) moist; massive; slightly hard, friable, slightly sticky, plastic; 10 percent durinodes; violently effervescent; 5 percent pebbles; moderately alkaline (pH 8.0)

**Type location:** Elko County, Nevada; in an unsectionized area, about 15 miles northwest of Midas; 41 degrees, 25 seconds, 47 seconds north

latitude, 116 degrees, 56 minutes, 07 seconds west longitude.

### Range in Characteristics

*Soil moisture:* Usually dry; moist in some part during the winter and spring

*Soil temperature:* 45 to 47 degrees F.

*Mollic epipedon thickness:* 7 to 12 inches thick.

*Depth to base of Bt horizons:* 20 to 30 inches.

*Depth to weak silica-cementation:* 20 to 36 inches.

*Depth to paralithic or lithic contact:* 40 to 60 inches.

*Other features:* Some pedons have thin AB or BA horizons with common or many uncoated sand grains on faces of peds.

*Control section:*

Clay content--35 to 50 percent, when mixed.

Rock fragments--0 to 15 percent.

#### A horizons:

Value--4 or 5 dry, 2 or 3 moist.

Chroma--2 or 3.

Reaction--Neutral or mildly alkaline.

#### Bt horizons:

Value--5 through 7 dry, 3 through 6 moist.

Chroma--3 or 4.

Structure--Moderate or strong, fine or medium prismatic or subangular blocky.

Consistence--Hard to extremely hard dry; friable to very firm, moist; sticky or very sticky, plastic or very plastic wet.

Reaction--Neutral to moderately alkaline.

Texture--Clay, silty clay, sandy clay or clay loam.

#### Bqk horizons:

Hue--2.5Y or 10YR.

Value--5 through 8 dry, 3 through 7 moist.

Chroma--2 through 4.

Texture--Loam, sandy loam, loamy sand, or coarse sandy loam.

Reaction--Moderately alkaline or strongly alkaline.

Cementation--Continuously brittle matrix. Some pedons have durinodes in a friable matrix in lower subhorizons.

Consistence--Very firm or firm and brittle when moist, some pedons are friable moist in lower subhorizons. Some pedons have Bq subhorizons that are brittle and lack secondary carbonates.

## Thwoop Series

The Thwoop series consists of moderately deep, well drained soils that formed in residuum and colluvium from rhyolite and shallow intrusive rocks. The Thwoop soils are on hills and mountains. Slopes are 4 to 15 percent. The mean annual precipitation is about 11 inches and the mean annual temperature is about 44 degrees F.

**Taxonomic class:** Clayey-skeletal, montmorillonitic, frigid Aridic Durixerolls

**Typical pedon:** Thwoop gravelly silt loam, 8 to 15 percent slopes, located in an area of map unit 1980. (Colors are for dry soils unless otherwise noted.) The soil surface is covered with 20 percent pebbles and 5 percent cobbles.

- Al--0 to 4 inches; brown (10YR 5/3) gravelly silt loam, very dark grayish brown (10YR 3/2) moist; moderate fine and medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots; common very fine and fine tubular pores; 15 percent pebbles; neutral (pH 7.2); clear smooth boundary. (3 to 6 inches thick)
- A2--4 to 10 inches; brown (10YR 5/3) silt loam, very dark grayish brown (10YR 3/2) moist; weak fine and medium subangular blocky structure; soft, very friable, slightly sticky and plastic; common medium and few very fine and fine roots; many very fine and fine tubular pores; 5 percent pebbles; neutral (pH 7.2); clear smooth boundary. (4 to 8 inches thick)
- Bt--10 to 16 inches; yellowish brown (10YR 5/4) very gravelly clay, dark yellowish brown (10YR 4/4); moderate fine and medium subangular blocky structure; slightly hard, friable, sticky and plastic; common medium and few very fine and fine roots; many very fine, fine, and few medium tubular pores; common moderately thick clay films on faces of peds and lining pores; 10 percent cobbles, 30 percent pebbles; neutral (pH 7.2); clear wavy boundary. (5 to 9 inches thick)
- Btk--16 to 25 inches; dark yellowish brown (10YR 4/6) very gravelly clay, dark yellowish brown (10YR 4/4) moist; strong fine and medium subangular blocky structure; slightly hard, firm, sticky and very plastic; common medium roots; common fine and medium tubular pores; many thick clay films on faces of peds and lining pores; common fine soft lime masses and filaments, 10 percent cobbles, 40 percent pebbles, noneffervescent matrix, strongly effervescent in spots; mildly alkaline (pH 7.4); clear wavy boundary. (7 to 12 inches thick)
- Bqkm--25 to 27 inches; indurated duripan with 1 to 2 millimeter laminar cap; extremely hard, very firm; violently effervescent; clear wavy boundary. (1 to 4 inches thick)
- R--27 inches; hard, fractured rhyolite.

**Type location:** Elko County, Nevada; approximately 8 miles southwest of Midas; about 2,550 feet west and 1,950 feet north of the southeast corner of section 12, T. 37 N., R. 45 E.; 41 degrees, 5 minutes, 50 seconds north latitude, 116 degrees, 50 minutes, 40 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Moist in winter and spring, dry July through October

*Soil temperature:* 44 to 47 degrees F.

*Mollic epipedon thickness:* 7 to 14 inches.

*Depth to bedrock:* 21 to 32 inches.

*Depth to duripan:* 20 to 30 inches.

*Control section:*

Clay content--35 to 45 percent.

Rock fragments--35 to 60 percent, mainly pebbles.

Soil reaction--Neutral or mildly alkaline.

#### A horizons:

Value--4 or 5 dry.

Chroma--2 or 3.

Structure--Weak or moderate, subangular blocky.

#### Bt and Btk horizons:

Value--4 or 5 dry, 3 or 4 moist.

Chroma--4 to 6.

Texture--Very gravelly clay or very gravelly clay loam.

Carbonates--Noneffervescent or slightly effervescent matrix with strong effervescence in spots, generally increasing with depth.

## Troughs Series

The Troughs series consists of shallow to a duripan, well drained soils on plateaus. They formed in residuum, alluvium and loess from basalt and rhyolite. Permeability is moderately slow. Slopes are 2 to 15 percent. The average annual precipitation is about 10 inches and the average annual temperature is about 47 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic, shallow Xerollic Durargids

**Typical pedon:** Troughs gravelly loam, 2 to 4 percent slopes, located in an area of map unit 2790. Colors are for dry soil unless otherwise noted.) The soil surface is covered with 15 percent pebbles and 5 percent cobbles.

- A1--0 to 2 inches; pale brown (10YR 6/3) gravelly loam, brown (10YR 4/3) moist; weak medium platy structure; soft, very friable, slightly sticky, plastic; few very fine roots; common very fine vesicular pores; 15 percent pebbles, 5 percent cobbles; mildly alkaline (pH 7.4); abrupt smooth boundary. (1 to 8 inches thick)
- A2--2 to 6 inches; pale brown (10YR 6/3) gravelly clay loam, dark brown (10YR 3/3) moist; weak fine subangular blocky structure; soft, friable, sticky, plastic; common very fine roots; few very fine tubular pores; 15 percent pebbles; mildly alkaline (pH 7.4); clear smooth boundary. (0 to 7 inches thick)



Bt--6 to 14 inches; pale brown (10YR 6/3) very cobbly clay loam, brown (10YR 4/3) moist; moderate fine subangular blocky structure; hard, firm sticky, plastic; few very fine roots; few very fine tubular pores; common moderately thick clay films on faces of peds; 5 percent pebbles, 35 percent cobbles; mildly alkaline (pH 7.2); clear smooth boundary. (4 to 11 inches thick)

Bqkm--14 to 20 inches; very pale brown (10YR 8/3) continuous indurated duripan, very pale brown (10YR 7/3) moist; massive; extremely hard, extremely firm. (2 to 20 inches thick)

R--20 inches; hard rhyolite.

**Type location:** Elko County, Nevada; in an unsectionized area, approximately 18 miles north of Midas; 41 degrees, 29 minutes, 04 seconds north latitude, 116 degrees, 58 minutes, 37 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Usually dry; moist in winter and spring, dry June through October

*Soil temperature:* 47 to 52 degrees F.

*Depth to duripan:* 12 to 20 inches

*Depth to bedrock:* 20 to 40 inches

*Control section:*

Clay content--27 to 35.

Rock fragments--averages 35 to 50 percent

#### A horizons:

Value--4 through 7 dry, 3 through 5 moist

Chroma--2 or 3

Reaction--Moderately alkaline

#### Bt horizon:

Value--6 or 7 dry, 3 through 5 moist

Chroma--3 or 4

Texture--Cobbly clay loam, very cobbly clay loam, very gravelly clay loam.

Rock fragments--25 to 50 percent

Reaction--Mildly alkaline through strongly alkaline

Effervescence--Noneffervescent through strongly effervescent in the lower part.

## Trunk Series

The Trunk series consists of moderately deep, well drained soils that formed in residuum and colluvium from mixed rocks. The Trunk soils are on mountains, hills and side slopes of plateaus. Slopes are 4 to 50 percent. The mean annual precipitation is about 9 inches and the mean annual temperature is about 47 degrees F.

**Taxonomic class:** Fine, montmorillonitic, mesic Xerollic Haplargids

**Typical pedon:** Trunk cobbly loam, 4 to 15 percent slopes, located in an area of map unit 1833. (Colors are for dry soil unless otherwise noted.) The soil surface is covered with 10 percent pebbles and 5 percent cobbles.

A--0 to 5 inches; pale brown (10YR 6/3) cobbly loam, dark brown (10YR 4/3) moist; moderate very fine platy structure; soft, very friable, slightly sticky, slightly plastic; many very fine and few fine roots; many very fine and few fine vesicular pores; 10 percent pebbles and 5 percent cobbles; mildly alkaline (pH 7.6); clear smooth boundary. (3 to 6 inches thick)

Bt1--5 to 11 inches; brown (10YR 5/3) gravelly clay, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; slightly hard, friable, sticky, plastic; common very fine and fine roots; many very fine tubular pores; many thin clay films on faces of peds and lining pores; 15 percent pebbles; mildly alkaline (pH 7.8); clear smooth boundary. (6 to 12 inches thick)

Btk1--11 to 15 inches; yellowish brown (10YR 5/4) gravelly clay, dark yellowish brown (10YR 3/4) moist; moderate medium prismatic structure parting to weak fine and medium subangular blocky; hard, firm, sticky, plastic; common very fine and fine, few medium roots; common very fine and fine tubular pores; many moderately thick clay films on faces of peds and lining pores; 25 percent pebbles, 5 percent cobbles; slightly effervescent, lime is disseminated; moderately alkaline (pH 8.2); clear smooth boundary. (4 to 12 inches thick)

Btk2--15 to 23 inches; pale brown (10YR 6/3) gravelly clay, dark yellowish brown (10YR 4/4) moist; moderate fine and medium subangular blocky structure; hard, firm, sticky, plastic; common very fine and fine, few medium roots; common very fine and fine tubular pores; common thin clay films on faces of peds and lining pores; 25 percent pebbles, 5 percent cobbles; strongly effervescent, lime is disseminated; moderately alkaline (pH 8.4); abrupt wavy boundary.

R--23 inches; rhyolite.

**Type location:** Elko County, Nevada; approximately 18 miles southwest of Midas; about 1,500 feet north and 1,000 feet west of the southeast corner of section 27, T. 37 N., R. 48 E.; 41 degrees, 03 minutes, 07 seconds north latitude, 116 degrees, 32 minutes, 03 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Usually dry; moist in the late fall, winter and early spring months, dry late May through October

*Soil temperature:* 47 to 53 degrees.

*Depth to bedrock:* 20 to 40 inches.

*Depth to lime:* 10 to 20 inches.

**A horizon:**

Value--5 or 6 dry, 3 through 5 moist.  
 Chroma--2 or 3.  
 Reaction--Neutral through mildly alkaline.  
 Structure--Granular or platy.

**Bt horizons:**

Hue--10YR or 7.5YR.  
 Value--5 or 6 dry, 3 through 5 moist.  
 Chroma--3 or 4.  
 Texture--Gravelly clay loam or gravelly clay with more than 30 percent sand.  
 Clay content--35 to 50 percent.  
 Rock fragments--15 to 35 percent, mainly pebbles.  
 Reaction--Neutral or mildly alkaline in noncalcareous upper sub horizon, moderately or strongly alkaline in calcareous lower subhorizon.  
 Consistence--Slightly hard to very hard, dry; friable or firm, moist.

**Tuffo Series**

The Tuffo series consists of very shallow, and shallow somewhat excessively drained soils that formed in residuum from tuff, welded tuff, and tuffaceous sandstone. Tuffo soils are on rock core areas of fan piedmont remnants and hills. Slopes are 4 to 50 percent. The mean annual precipitation is about 10 inches and the mean annual temperature is about 46 degrees F.

**Taxonomic class:** Ashy, nonacid, mesic, shallow Vitrandic Torriorthents

**Typical pedon:** Tuffo fine sandy loam, 4 to 15 percent slopes, located in an area of map unit 1852. (Colors are for dry soil unless otherwise noted.)

- A--0 to 6 inches; light gray (10YR 7/2) fine sandy loam, dark grayish brown (10YR 4/2) moist; moderate fine and medium platy structure; slightly hard, friable, slightly sticky, slightly plastic; many very fine and fine, common medium, few coarse roots; many very fine and fine tubular, few very fine interstitial pores; 5 percent pebbles; neutral (pH 6.8); clear wavy boundary. (1 to 6 inches thick)
- C--6 to 13 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 4/3) moist; weak fine subangular block structure; soft, very friable, slightly sticky, slightly plastic; many very fine, few fine roots; many very fine interstitial, and few very fine tubular pores; 5 percent pebbles; neutral (pH 7.0); abrupt wavy boundary. (3 to 9 inches thick)
- Cr--13 to 20 inches; soft tuffaceous sandstone with few, fine lime seams along fractures. Many very fine and fine roots matted on bedrock interface.

**Type location:** Elko County, Nevada; in an unsectionized area, about 1 mile west of Deep Creek Reservoir; 41 degrees, 35 minutes, 50 seconds north latitude, 116 degrees, 19 minutes, 40 seconds west longitude.

**Range in Characteristics**

*Soil moisture:* Usually dry; moist in winter and spring, dry from late June through October

*Soil temperature:* 47 to 52 degrees F.

*Depth to paralithic contact:* 4 to 14 inches.

*Pyroclastic material:* 60 to 75 percent.

*Reaction:* Neutral or mildly alkaline.

*Control section:*

Clay content--5 to 15 percent.

Rock fragments--5 to 25 percent, mainly pebbles.

**A horizon:**

Value--5 through 7 dry, 3 or 4 moist.  
 Chroma--2 through 4 dry or moist.  
 Structure--Weak or moderate, fine to coarse platy.

**C horizon:**

Hue--2.5Y or 10YR.  
 Value--6 or 7 dry, 4 or 5 moist.  
 Chroma--2 through 4 dry or moist.  
 Texture--Dominantly very fine sandy loam or fine sandy loam with gravelly sandy loam common in some pedons.  
 Structure--Weak or moderately fine or medium subangular blocky or it is massive.

**Cr horizon:**

Carbonates--Few to common lime seams along fracture planes.

**Tusel Series**

The Tusel series consists of deep and very deep well drained soils that formed in residuum and colluvium weathered from quartzite, welded tuff, conglomerate, chert and shale with a component of loess high in pyroclastic material. Tusel soils are on side slopes of hills and mountains. Slopes are 4 to 75 percent. The mean annual precipitation is about 17 inches and the mean annual temperature is about 43 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed Argic Pachic Cryoborolls

**Typical pedon:** Tusel very gravelly loam, 15 to 30 percent slopes, located in an area of map unit 1742. (Colors are for dry soil unless otherwise noted.) The soil surface is partially covered by 35 percent pebbles.



A1--0 to 3 inches; brown (10YR 4/3) very gravelly loam, very dark brown (10YR 2/2) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine roots; many very fine interstitial and few fine tubular pores; 35 percent pebbles; neutral (pH 6.8); clear wavy boundary. (2 to 10 inches thick)

A2--3 to 17 inches; brown (10YR 4/3) very gravelly loam, very dark grayish brown (10YR 3/2) moist; weak fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine, common fine and few medium roots; many very fine and few fine tubular pores; 35 percent pebbles; neutral (pH 6.8); clear wavy boundary. (7 to 14 inches thick)

Bt1--17 to 28 inches; yellowish brown (10YR 5/4) very gravelly clay loam, dark yellowish brown (10YR 3/4) moist; moderate medium angular blocky structure; hard, friable, slightly sticky and plastic; many very fine and common fine roots; many fine and common medium and very fine tubular pores; 45 percent pebbles and 10 percent cobbles; few thin clay films on faces of peds and lining pores; neutral (pH 6.8); abrupt wavy boundary. (0 to 12 inches thick)

Bt2--28 to 58 inches; yellowish brown (10YR 6/4) extremely gravelly clay loam, dark yellowish brown (10YR 4/4) moist; moderate fine and medium subangular blocky structure; hard, firm, slightly sticky and plastic; common very fine and few fine roots; common very fine and few fine tubular pores; 45 percent pebbles, 10 percent cobbles; common thin clay films on faces of peds and lining pores; neutral (pH 6.6); abrupt irregular boundary. (12 to over 25 inches thick)

R--58 inches; hard siltstone.

**Type location:** Elko County, Nevada; approximately 2 miles south of Bull Run Reservoir; about 2,100 feet east and 2,800 feet south of the northwest corner of section 20, T. 43 N., R. 52 E.; 41 degrees, 36 minutes, 40 seconds north latitude, 116 degrees, 09 minutes, 25 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Usually moist in the late fall through early summer, dry late July through September

*Soil temperature:* 43 to 47 degrees F.

*Average summer soil temperature:* 58 to 59 degrees F.

*Depth to bedrock:* 40 to over 80 inches.

*Depth to base of Bt horizon:* 36 to over 50 inches.

*Mollic epipedon thickness:* 16 to 22 inches, includes the upper argillic horizon of some pedons.

*Control section:*

Clay content--25 to 35 percent.

Rock fragments--50 to 75 percent, mainly pebbles.

Reaction--Slightly acid or neutral.

#### A horizons:

Value--4 or 5 dry, 2 or 3 moist.

Chroma--2 or 3.

Structure--Weak to strong, very fine to medium granular or subangular blocky.

#### Bt horizons:

Hue--10YR or 7.5YR.

Value--4 through 6 dry, 3 or 4 moist.

Chroma--2 through 4.

Texture--Very gravelly or extremely gravelly sandy clay loam or very gravelly or extremely gravelly clay loam, with 40 to 60 percent sand.

Clay content--25 to 35 percent, when averaged.

Rock fragments--40 to 60 percent pebbles and 10 to 25 percent cobbles and 0 to 10 percent stones.

Consistence--Slightly sticky or sticky and slightly plastic or plastic.

Structure--Weak to strong subangular blocky or angular blocky. Some pedons have lower subhorizons that are massive.

## Tusk Series

The Tusk series consists of very deep, well drained soils formed in colluvium from rhyolite and other volcanic rocks. Tusk soils are on side slopes of hills and mountains. Slopes are 8 to 50 percent. The mean annual precipitation is about 14 inches and the mean annual temperature is about 44 degrees F.

**Taxonomic class:** Fine-loamy, mixed, frigid Pachic Argixerolls

**Typical pedon:** Tusk gravelly loam, 8 to 15 percent slopes, located in an area of map unit 1640. (Colors are for dry soil unless otherwise noted.) The soil surface is covered with 10 percent pebbles and 10 percent cobbles.

A1--0 to 2 inches; brown (10YR 5/3) gravelly loam, very dark grayish brown (10YR 3/2) moist; weak very fine platy structure; soft, very friable, slightly sticky and slightly plastic; many very fine roots; common very fine tubular pores; 10 percent pebbles, 5 percent cobbles; neutral (pH 7.2); clear smooth boundary. (2 to 4 inches thick)

A2--2 to 5 inches; brown (10YR 5/3) loam, very dark brown (10YR 2/2) moist; moderate very fine platy structure; soft, very friable, slightly sticky and slightly plastic; many very fine and common fine roots; common very fine tubular pores; 10 percent pebbles, neutral (pH 7.2); clear smooth boundary. (2 to 9 inches thick)

A3--5 to 14 inches; brown (10YR 4/3) loam, very dark grayish brown (10YR 3/2) moist; moderate fine and medium subangular blocky structure; slightly hard, friable, sticky and plastic; common very fine, few fine and medium roots; common very fine tubular

pores; 10 percent pebbles, neutral (pH 7.2); clear smooth boundary. (0 to 10 inches thick)

- Bt1**--14 to 23 inches; brown (10YR 4/3) clay loam; very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure; slightly hard, friable, sticky and plastic; common very fine and few fine and medium roots; common very fine tubular pores; several krotovinas less than 15 millimeters in size; few thin films on faces of peds and lining pores; 10 percent gravel, neutral (pH 7.2); clear irregular boundary. (6 to 15 inches thick)
- Bt2**--23 to 38 inches; light yellowish brown (10YR 6/4) gravelly clay loam, dark yellowish brown (10YR 3/4) moist; moderate fine and medium subangular blocky structure; hard, firm, sticky and plastic; common very fine and few fine roots; common very fine tubular pores; common thin clay films on faces of peds and lining pores; 15 percent pebbles; 10 percent cobbles; mildly alkaline (pH 7.6); clear wavy boundary. (8 to 15 inches thick)
- Bt3**--38 to 60 inches; very pale brown (10YR 7/4) extremely cobbly loam, dark yellowish brown (10YR 3/4) moist; massive; slightly hard; friable, sticky and plastic; common very fine and few fine roots; common very fine and fine tubular pores; few clay films on rock fragment surfaces; 40 percent pebbles, 30 percent cobbles, mildly alkaline (pH 7.4).

**Type location:** Elko County, Nevada; about 7 miles west of Midas; 41 degrees, 16 minutes, 00 seconds north latitude, 116 degrees, 54 minutes, 23 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Moist in winter and spring, dry from mid July to October

*Soil temperature:* 43 to 47 degrees F.

*Mollic epipedon thickness:* 20 to 35 inches. Includes the upper part of the argillic horizon.

*Solum thickness:* 40 to over 60 inches.

*Reaction:* Neutral or mildly alkaline.

*Control section:*

Rock fragments--15 to 35 percent, mainly pebbles.

Clay content--27 to 35 percent.

#### A horizons:

Value--2 or 3 moist.

Chroma--2 or 3.

Structure--Platy, granular or subangular blocky.

#### Bt horizons:

Value--4 through 7 dry.

Chroma--2 through 4.

Texture--The upper part is clay loam and gravelly clay loam, with a mixed average of gravelly clay loam. Lower subhorizons are very gravelly clay loam to extremely cobbly loam.

Reaction--Neutral to mildly alkaline.

## Tweba Series

The Tweba series consists of very deep, very poorly drained soils that formed in loamy alluvium from mixed rock sources. Tweba soils are on flood plains, stream flood plains and inset fans. Slopes are 0 to 2 percent. The mean annual precipitation is about 9 inches and the mean annual temperature is about 48 degrees F.

**Taxonomic class:** Coarse-loamy, mixed (calcareous), mesic Aeric Fluvaquents

**Typical pedon:** Tweba very fine sandy loam, located in an area of map unit 1290. (Colors are for dry soil unless otherwise noted.)

- A**--0 to 4 inches; pale brown (10YR 6/3) very fine sandy loam, dark brown (10YR 4/3) moist; weak very thin platy structure; slightly hard, very friable, slightly sticky, slightly plastic; many very fine and fine roots; many very fine vesicular and few fine tubular pores; mildly alkaline (pH 7.6); clear smooth boundary. (1 to 7 inches thick)
- C1**--4 to 15 inches; light gray (10YR 7/2) very fine sandy loam, grayish brown (10YR 5/2) moist; massive; slightly hard, very friable, slightly sticky, slightly plastic; many very fine roots; many very fine tubular pores; strongly effervescent; few fine lime filaments; moderately alkaline (pH 8.4); clear smooth boundary. (3 to 14 inches thick)
- C2**--15 to 27 inches; light brownish gray (10YR 6/2) fine sandy loam, grayish brown (10YR 5/2) moist; few fine faint mottles; massive; slightly hard, friable, slightly sticky, slightly plastic; common very fine roots; many very fine tubular pores; strongly effervescent; few fine lime filaments; moderately alkaline (pH 8.4); clear smooth boundary. (5 to 10 inches thick)
- C3**--27 to 37 inches; pale brown (10YR 6/3) sandy loam, dark brown (10YR 4/3) moist; few fine faint mottles; massive; slightly hard, very friable, slightly sticky, slightly plastic; common very fine roots; common very fine tubular pores; strongly effervescent; few fine lime filaments; strongly alkaline (pH 8.6); clear smooth boundary. (5 to 10 inches thick)
- C4**--37 to 60 inches; light brownish gray (10YR 6/2) fine sandy loam, dark grayish brown (10YR 4/2) moist; few fine faint mottles; massive; slightly hard, friable, slightly sticky, slightly plastic; few very fine roots; common fine tubular pores; strongly effervescent; few fine lime filaments; moderately alkaline (pH 8.4)

**Type location:** Eureka County, Nevada; approximately 18 miles south of Willow Creek Reservoir; about 1,000 feet north and 500 feet east of the southwest corner of section 20, T. 36 N., R 48 E.; 40 degrees, 58 minutes, 51 seconds north latitude,



116 degrees, 35 minutes, 02 seconds west longitude.

### Range in Characteristics

*Soil moisture:* Usually moist; dry in midsummer and early fall, apparent seasonal water table is between a depth of 14 to 20 inches for some time during most years usually February to June. Drained phases are recognized

*Soil temperature:* 47 to 52 degrees F.

*Other features:* In some pedons, one or more buried A horizons with hue of 10YR or 5Y, value of 5 or 6 dry and 3 moist, chroma of 1 or 2 are below a depth of 30 inches.

#### Control section:

Clay content--10 to 18 percent, when mixed.

Texture--Average fine sandy loam or very fine sandy loam, but includes stratified very fine sandy loam, fine sandy loam, loam or silt loam in the upper subhorizons and very fine sandy loam, fine sandy loam, sandy loam, loamy fine sand or loamy sand in the lower subhorizons. Loamy fine sand and loamy sand are more common below 35 inches.

#### A horizon:

Hue--2.5Y or 10YR.

Value--5 through 7 dry, 3 through 5 moist.

Chroma--2 or 3.

Structure--Very fine angular blocky or very thin platy structure or it is massive.

Reaction--Mildly alkaline through strongly alkaline.

Effervescence--Noneffervescent through strongly effervescent.

#### C horizons:

Hue--2.5Y or 10YR.

Value--6 or 7 dry, 4 or 5 moist.

Chroma--1 through 3 dry, and 2 or 3 moist.

Reaction--Mildly alkaline to very strongly alkaline.

Effervescence--Slightly effervescent to strongly effervescent to a depth of 30 to 45 inches and noneffervescent to strongly effervescent below.

## Tweener Series

The Tweener series consists of very shallow and shallow, well drained soils that formed in residuum and colluvium from welded tuff, rhyolite, chert, shale and conglomerate. The Tweener soils are on hills and mountains. Slopes are 4 to 75 percent. The mean annual precipitation is about 14 inches and the mean annual temperature is about 43 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, frigid Lithic Argixerolls

**Typical pedon:** Tweener very cobbly sandy loam, 4 to 15 percent slopes, located in an area of map unit 1933. (Colors are for dry soils unless otherwise noted.) The surface is covered with 10 percent pebbles and 25 percent cobbles.

A--0 to 5 inches; dark grayish brown (10YR 4/2) very cobbly sandy loam, very dark brown (10YR 2/2) moist; weak medium and coarse subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine through coarse roots; few very fine tubular pores; 5 percent stones, 20 percent cobbles, 10 percent pebbles; neutral (pH 7.2); clear wavy boundary. (3 to 8 inches thick)

Bt--5 to 8 inches; brown (10YR 4/3) very cobbly clay loam, dark brown (10YR 3/3) moist; weak medium and coarse subangular blocky structure; hard, friable, sticky and plastic; common very fine and fine, few medium roots; common very fine tubular pores; common thin clay films as bridges; common colloidal stains on faces of peds; 15 percent stones, 30 percent cobbles, 10 percent pebbles; neutral (pH 7.2); abrupt smooth boundary (3 to 6 inches thick)

R--8 inches; hard, fractured welded tuffs.

**Type location:** Elko County, Nevada; approximately 2 miles northeast of St. Johns ranch buildings; in an unsectionized area, about 5,200 feet east and 2,400 feet south of the southeast corner of section 32, T. 38 N., R. 50 E.; 41 degrees, 12 minutes, 00 seconds north latitude, 116 degrees, 20 minutes, 18 seconds west longitude.

### Range in Characteristics

*Soil moisture:* Moist in winter and spring, dry from late July through October for 70 to 100 consecutive days

*Soil temperature:* 44 to 47 degrees F.

*Mollic epipedon thickness:* 7 to 14 inches and includes all of the argillic horizon.

*Depth to bedrock:* 7 to 14 inches.

#### Control section:

Clay content--18 to 35 percent.

Rock fragments--35 to 60 percent; mainly cobble and stone size fragments of tuff and rhyolite.

#### A horizon:

Value--4 or 5 dry; 2 or 3 moist.

#### Bt horizon:

Value--4 or 5 dry; 2 or 3 moist.

Chroma--2 or 3.

Texture--Very cobbly clay loam or very cobbly loam.

Clay content--25 to 40 percent.

## Uprville Series

The Uprville series consists of very deep, well drained, moderately permeable soils that formed in alluvium from mixed volcanic and granitic rocks. The Uprville soils are on alluvial fans, fan piedmont remnants and fan skirts. Slopes are 0 to 4 percent. Mean annual precipitation is about 12 inches and the mean annual temperature is about 43 degrees F.

**Taxonomic class:** Sandy-skeletal, mixed, frigid Aridic Haploxerolls

**Typical pedon:** Uprville gravelly loam, 0 to 2 percent slopes, located in an area of map unit 140. (Colors are for dry soil unless otherwise noted.)

A1--0 to 3 inches; grayish brown (10YR 5/2) gravelly loam, very dark grayish brown (10YR 3/2) moist; weak fine subangular blocky structure; slightly hard, very friable, slightly sticky, slightly plastic; many very fine roots; common very fine tubular pores; 25 percent pebbles; neutral (pH 6.8); clear smooth boundary. (2 to 5 inches thick)

A2--3 to 10 inches; grayish brown (10YR 5/2) gravelly loam, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky, slightly plastic; common very fine and fine roots; common very fine tubular pores; 25 percent pebbles; neutral (pH 7.0); clear smooth boundary. (4 to 10 inches thick)

Bw1--10 to 19 inches; yellowish brown (10YR 5/4) very gravelly loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; hard, friable, sticky plastic; common very fine and fine roots; very fine tubular pores; 35 percent pebbles; neutral (pH 7.0); clear smooth boundary. (5 to 12 inches thick)

Bw2--19 to 21 inches; yellowish brown (10YR 5/4) very gravelly loam, dark yellowish brown (10YR 3/4) moist; moderate medium and coarse subangular blocky structure; hard, friable, sticky, plastic; common very fine and fine roots; common very fine tubular pores; 40 percent pebbles, 15 percent cobbles; neutral (pH 7.0); abrupt wavy boundary. (0 to 9 inches thick)

2C--21 to 60 inches; brown (10YR 4/3) extremely gravelly coarse sand, dark brown (10YR 3/3) moist; single grained; loose, nonsticky, nonplastic; few very fine roots; many very fine interstitial pores; 55 percent pebbles, 25 percent cobbles; neutral (pH 7.0).

**Type location:** Elko County, Nevada; approximately 10 miles northeast of Tuscarora; about 800 feet east and 2,300 feet south of the northwest corner of section 22, T. 41 N., R. 52 E.; 41 degrees, 26 minutes, 15 seconds north latitude, 116 degrees, 07 minutes, 15 seconds west longitude.

### Range in Characteristics

*Soil moisture:* Usually dry; moist during the winter and spring, but are dry mid-June through October

*Soil temperature:* 43 to 47 degrees F.

*Mollic epipedon thickness:* 10 to 15 inches.

*Depth to 2C horizons:* 15 to 27 inches.

*Control section:*

Clay content--Averages 5 to 12 percent.

Rock fragments--Averages 50 to 75 percent, mainly pebbles.

#### A horizons:

Chroma--2 or 3.

Structure--Platy, granular, subangular or angular blocky.

#### Bw horizons:

Value--5 or 6 dry, 3 or 4 moist.

Chroma--3 or 4.

Texture--Very gravelly loam or very gravelly sandy loam with thin subhorizons of gravelly coarse sandy loam common in some pedons.

Clay content--15 to 22 percent.

Rock fragments--20 to 55 percent, mainly pebbles and some cobbles.

#### 2C horizon:

Hue--2.5Y or 10YR.

Value--5 or 6 dry, 4 or 5 moist.

Chroma--4 through 6 dry.

Texture--Extremely cobbly loamy sand, extremely cobbly sand, extremely gravelly coarse sand.

Clay content--0 to 5 percent.

Rock fragments--60 to 85 percent, mainly pebbles and cobbles.

## Vanwyper Series

The Vanwyper series consists of moderately deep, well drained soils that formed in residuum and colluvium weathered from mixed rock sources. Vanwyper soils are on crests and side slopes of hills, plateaus and mountains. Slopes are 2 to 50 percent. The mean annual precipitation is about 10 inches and the mean annual temperature is about 45 degrees F.

**Taxonomic class:** Clayey-skeletal, montmorillonitic, mesic Xerollic Haplargids

**Typical pedon:** Vanwyper very stony loam, 15 to 50 percent slopes, is located in map unit 1830. (Colors are for dry soil unless otherwise noted.) The soil surface is partially covered with 30 percent pebbles, 5 percent cobbles.

A1--0 to 5 inches; light yellowish brown (10YR 6/4) gravelly loam, dark yellowish brown (10YR 4/4) moist; weak thin platy structure; soft, very friable,



slightly sticky, slightly plastic; many very fine and fine roots; many very fine tubular pores; 20 percent pebbles; neutral (pH 6.6); clear smooth boundary. (1 to 5 inches thick)

A2--5 to 10 inches; light yellowish brown (10YR 6/4) gravelly loam, dark yellowish brown (10YR 4/4) moist; weak fine and medium subangular blocky structure; slightly hard, very friable, slightly sticky, slightly plastic; common very fine and fine roots; common very fine tubular pores; 25 percent pebbles; neutral (pH 6/8); clear smooth boundary. (4 to 8 inches thick)

Bt1--10 to 12 inches; reddish brown (5YR 5/4) very gravelly clay loam, reddish brown (5YR 4/4) moist; weak medium subangular blocky structure; slightly hard, friable, sticky, plastic; few very fine roots; few very fine tubular pores; common thin clay films on faces of peds; 50 percent pebbles; neutral (pH 6.8); clear smooth boundary. (0 to 5 inches thick)

2Bt2--12 to 25 inches; reddish brown (5YR 4/4) very cobbly clay, reddish brown (5YR 4/4) moist; weak fine prismatic structure; hard, firm; sticky, very plastic; few very fine roots; few very fine tubular pores; continuous thin clay films on faces of peds; 20 percent pebbles, 30 percent cobbles; neutral (pH 6.8); abrupt smooth boundary. (6 to 20 inches thick)

R--25 inches; andesitic rock.

**Type location:** Elko County, Nevada; approximately 5 miles east of Rock Creek Ranch; about 1,400 feet north and 1,700 feet east of the southwest corner of section 14, T. 37 N., R. 47 E.; 41 degrees, 04 minutes, 53 seconds north latitude, 116 degrees, 08 minutes, 12 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Usually dry; moist in the winter and spring, dry from late June through mid October

*Soil temperature:* 47 to 50 degrees F.

*Depth to bedrock:* 20 to 40 inches.

*Reaction:* Neutral or mildly alkaline.

*Control section:*

Percent clay--35 to 55 percent.

Rock fragments--35 to 60 percent dominated by cobbles.

#### A horizons:

Value--3 or 4 moist.

Chroma--2 through 4.

Structure--Weak to strong, very thin through medium platy or very fine through medium subangular blocky.

Consistence--Very friable or friable, moist; slightly sticky or sticky and slightly plastic or plastic, wet.

#### Bt horizons:

Hue--10YR, 7.5YR or 5YR.

Value--4 through 6 dry, 3 through 5 moist.

Chroma--3 or 4.

Textures--Very cobbly loam, very cobbly clay, very gravelly clay loam in the upper part of some pedons.

Structure--Angular or subangular blocky or prismatic structure in the lower part.

Other features--Some pedons have a thin coat of carbonates on the undersides of rock fragments.

## Welch Series

The Welch series consists of very deep, very poorly drained soils that formed in alluvium from mixed volcanic rock sources with a component of vitric pyroclastic materials. Welch soils are on flood plains, stream terraces, inset fans and in narrow hill and mountain valleys, bottomland, and drainageways. Slopes are 0 to 15 percent. The mean annual precipitation is about 14 inches and the mean annual temperature is about 42 degrees F.

**Taxonomic class:** Fine-loamy, mixed, frigid Cumulic Haplaquolls

**Typical pedon:** Welch silt loam, drained, 0 to 2 percent slopes, is located in an area of map unit 690. (Colors for dry soils unless otherwise noted).

A1--0 to 2 inches; gray (10YR 5/1) silt loam, black (10YR 2/1) moist; strong fine and medium gravelly structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine roots; common very fine and fine tubular pores; neutral (pH 7.3) clear wavy boundary. (2 to 15 inches thick)

A2--2 to 10 inches; gray (10YR 5/1) silt loam, black (10YR 2/1) moist; moderate fine and medium gravelly structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine, common fine and few medium roots; common very fine and fine tubular pores; neutral (pH 7.2); clear wavy boundary. (2 to 14 inches thick)

A3--10 to 30 inches; gray (10YR 5/1) clay loam, black (10YR 2/1) moist; few fine distinct strong yellowish brown (10YR 5/6) mottles; weak coarse subangular blocky structure; hard, friable, slightly sticky and slightly plastic; common very fine and few medium roots; many very fine and fine, and few medium tubular pores; neutral (pH 7.2); clear wavy boundary. (8 to 22 inches thick)

Cg--30 to 60 inches; gray (5Y 5/1) sandy clay loam, gray (10YR 5/1) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; many fine, common very fine and few medium tubular pores; neutral (pH 7.2).

**Type location:** Elko County, Nevada; approximately 5 miles northwest of Midas; about 300 feet west and 2,000 feet north of the southeast corner of section

35, T. 40 N., R. 45 E.; 41 degrees, 18 minutes, 04 seconds north latitude, 116 degrees, 16 minutes, 15 seconds west longitude.

### Range in Characteristics

*Soil moisture:* Welch soils are saturated at or near the surface for a least one month during most years, mainly during the late winter and early spring months, then drops to a depth of 18 to 36 inches from early spring through September. Drained phases are recognized

*Soil temperature:* 41 to 46 degrees F.

*Mollic epipedon thickness:* 26 to over 60 inches, organic matter decreases irregularly with increasing depth.

*Other features:* Buried A horizons are common. Some pedons have gravelly strata or strata of silty clay loam, silt loam, clay, loam, very fine sandy loam or sandy loam.

#### *Control section:*

Clay content--27 to 35 percent, when mixed.

Texture--Stratified dominantly sandy clay loam or clay loam.

Mineralogy--Mixed, but the parent material has a large component of vitric pyroclastic materials.

#### **A horizons:**

Hue--10YR through 5Y or neutral.

Value--3 through 5 dry, 2 or 3 moist.

Chroma--0 through 3 in the upper part and 0 through 2 in the lower part.

Reaction--Slightly acid or neutral.

Other features--Some pedons have high chroma iron mottles.

#### **C horizon:**

Hue--10YR, 2.5Y, 5Y or neutral.

Value--5 through 8 dry, 3 through 5 moist.

Chroma--0 through 2.

Reaction--Slightly acid to mildly alkaline.

Mottles--High chroma iron mottles are common in many pedons.

## Weso Series

The Weso series consists of very deep, well drained soils that formed in alluvium from mixed rock sources, with a loess mantle high in volcanic ash. Weso soils are on beach plains, relic lagoons, fan skirts, inset fans and fan piedmont remnants. Slopes are 0 to 8 percent. The mean annual precipitation is about 7 inches and the mean annual temperature is about 48 degrees F.

**Taxonomic class:** Coarse-loamy, mixed, mesic Duric Camborthids

**Typical pedon:** Weso very fine sandy loam, 0 to 2 percent slopes, located in an area of map unit 1572. (Colors are for dry soil unless otherwise noted.)

A1--0 to 3 inches; very pale brown (10YR 7/3) very fine sandy loam, brown (10YR 5/3) moist; moderate very fine platy structure; slightly hard, friable, slightly sticky, slightly plastic; many very fine roots; many very fine and fine vesicular pores; 2 percent pebbles; moderately alkaline (pH 8.2); clear smooth boundary. (1 to 5 inches thick)

A2--3 to 6 inches; pale brown (10YR 6/3) very fine sandy loam, brown (10YR 5/3) moist; weak very fine and fine platy structure; slightly hard, friable, slightly sticky, slightly plastic; common very fine and fine roots; many fine vesicular and common very fine tubular pores; moderately alkaline (pH 8.2); clear smooth boundary. (0 to 5 inches thick)

Bw--6 to 12 inches; very pale brown (10YR 7/3) fine sandy loam, brown (10YR 5/3) moist; weak fine and medium subangular blocky structure; slightly hard, friable, nonsticky, nonplastic; common fine roots; common very fine and fine tubular pores; 1 percent pebbles; moderately alkaline (pH 8.4); clear wavy boundary. (6 to 10 inches thick)

Bqk1--12 to 25 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 4/3) moist; massive; hard, firm, and brittle, nonsticky, nonplastic; common very fine roots; few very fine tubular pores; continuous brittle matrix; strongly effervescent; common fine lime filaments; strongly alkaline (pH 8.8); clear wavy boundary. (1 to 14 inches thick)

Bqk2--25 to 41 inches; very pale brown (10YR 7/3) fine sandy loam, brown (10YR 4/3) moist; massive; slightly hard, friable, nonsticky, nonplastic; common very fine roots; few very fine tubular pores; 30 percent durinodes; slightly effervescent; common fine lime filaments; 3 percent pebbles; strongly alkaline (pH 8.8); clear wavy boundary. (8 to 17 inches thick)

Bqk3--41 to 50 inches; very pale brown (10YR 7/4) fine sandy loam, brown (10YR 5/3) moist; massive; slightly hard, friable, nonsticky, nonplastic; common very fine roots; few very fine tubular pores; 20 percent durinodes; slightly effervescent; common fine lime filaments; 2 percent pebbles; strongly alkaline (pH 8.6); clear wavy boundary. (0 to 10 inches thick)

Bqk4--50 to 60 inches; very pale brown (10YR 7/3) fine sandy loam, brown (10YR 5/3) moist; massive; slightly hard, friable, nonsticky, nonplastic; few very fine roots; few very fine tubular pores; 35 percent durinodes; strongly effervescent; common fine lime filaments; 1 percent pebbles; strongly alkaline (pH 9.0).

**Type location:** Elko County, Nevada; approximately 22 miles west of Midas; about 800 feet west and 2,200 feet north of the southeast corner of section



22, T. 37 N., R. 44 E.; 41 degrees, 04 minutes, 08 seconds north latitude, 116 degrees, 59 minutes, 29 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Usually dry; moist for short periods in winter and spring, dry from late May through November

*Soil temperature:* 47 to 53 degrees F.

*Depth to base of Bw horizons: and upper boundary of silica cementation:* 10 to 18 inches.

*Other features:* Some pedons are underlain by skeletal material below depths of 40 inches.

#### Control section:

Clay content--5 to 15 percent.

Rock fragments--0 to 25 percent, mainly pebbles.

Textures--Dominantly fine sandy loam, very fine sandy loam or loam. Some pedons include minor strata of sandy loam, coarse sandy loam, or silt loam.

#### A horizons:

Value--6 or 7 dry, 3 through 5 moist.

Chroma--2 or 3.

Reaction--Moderately alkaline through very strongly alkaline.

#### Bw horizon:

Value--6 or 7 dry, 4 or 5 moist.

Chroma--2 through 4.

Reaction--Moderately alkaline through very strongly alkaline.

Other features--The Bw is noncalcareous.

#### Bqk horizon:

Value--6 or 7 dry, 4 or 5 moist.

Chroma--2 or 3.

Cementation--Ranges from continuously brittle matrix to several weakly cemented plates up to 1 inch thick with firm and brittle or friable material between plates. Subhorizons in some pedons have durinodes in a friable matrix.

Reaction--Moderately alkaline through very strongly alkaline.

## Wickahoney Series

The Wickahoney series consists of shallow, well drained soils that formed in residuum derived from rhyolite. Wickahoney soils are on summits and sideslopes of hills and plateaus and have slopes of 2 to 8 percent. The average annual temperature is about 42 degrees F., and the average annual precipitation is about 15 inches.

**Taxonomic class:** Clayey-skeletal, montmorillonitic, frigid Lithic Mollic Haploxeralfs

**Typical pedon:** Wickahoney extremely stony loam, 2 to 8 percent slopes in an area of map unit 241. (Colors are for dry soil unless otherwise noted.) The surface is covered with 25 percent pebbles, 15 percent cobbles and 10 percent stones.

A1--0 to 2 inches; light brownish gray (10YR 6/2) extremely stony loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure; slightly hard, friable, sticky and plastic; many very fine roots; few very fine tubular pores; 10 percent pebbles, 35 percent cobbles and 5 percent stones; neutral (pH 7.0); abrupt smooth boundary. (2 to 5 inches thick)

BA--2 to 5 inches; pale brown (10YR 6/3) very cobbly clay loam, very dark grayish brown (10YR 3/2) moist; moderate thin platy structure; slightly hard, friable, sticky and plastic; common very fine and fine roots; common very fine tubular pores; few thin clay films bridging sand grains; 10 percent pebbles, 40 percent cobbles and 5 percent stones; neutral (pH 6.8); abrupt smooth boundary. (0 to 7 inches thick)

Bt1--5 to 6 inches; brown (10YR 5/3) very cobbly clay loam, dark brown (7.5YR 3/4) moist; moderate fine platy structure; slightly hard, friable, sticky and plastic; common very fine and fine roots; common very fine tubular pores; common moderately thick clay films bridging sand grains and lining pores; 10 percent pebbles, 40 percent cobbles and 5 percent stones; neutral (pH 6.8); abrupt smooth boundary. (0 to 3 inches thick)

Bt2--6 to 14 inches; brown (7.5YR 4/4) very cobbly clay, dark brown (7.5YR 3/4) moist; moderate thin subangular blocky structure; very hard, very firm, very sticky and very plastic; few very fine roots; few very fine tubular pores; many moderately thick clay films on faces of peds and bridging sand grains; 15 percent pebbles and 25 percent cobbles; neutral (pH 6.8). (3 to 12 inches thick)

R--14 inches; rhyolite.

**Type location:** Elko County, Nevada; approximately 8 miles southwest of Owyhee; about 1,100 feet south and 500 feet west of the southeast corner of section 36, T. 46 N., R. 51 E.; 41 degrees, 49 minutes, 58 seconds north latitude, 116 degrees, 11 minutes, 40 seconds west longitude.

#### Range in Characteristics

*Soil temperature:* 41 to 47 degrees F.

*Summer soil temperature:* 61 to 67 degrees F.

*Depth to bedrock:* 10 to 20 inches

*Other features:* Dry color value 5 does not occur in combination with moist color 3/3 at depths of 7 inches or more. Btq horizons with high percentage of rock fragments occur in some pedons

**A horizon:**

Hue--10YR or 7.5YR  
 Value--5 or 6 dry, 2 to 4 moist  
 Chroma--2 or 3 dry or moist  
 Reaction--Slightly acid or neutral

**Bt horizons:**

Hue--10YR or 7.5YR  
 Value--5 or 6 dry, 3 or 4 moist  
 Chroma--3 or 4  
 Texture--Very cobbly clay, very gravelly clay or very gravelly clay loam  
 Clay content--35 to 55 percent  
 Rock fragments--35 to 60 percent  
 Reaction--Slightly acid through mildly alkaline  
 Other features--Thin, discontinuous silica deposits often appear on the undersides of rocks at the lower boundary

**Wieland Series**

The Wieland series consists of very deep, well drained soils that formed in alluvium from mixed rock sources with a component of loess and volcanic ash. Wieland soils are on summits and sideslopes of partial ballenas and fan piedmont remnants and plateaus. Slopes are 0 to 30 percent. The mean annual precipitation is about 9 inches and the mean annual temperature is about 48 degrees F.

**Taxonomic class:** Fine, montmorillonitic, mesic Durixerollic Haplargids

**Typical pedon:** Wieland loam, 2 to 4 percent slopes, is found in an area of map unit 2775. (Colors are for dry soil unless otherwise noted.)

A--0 to 4 inches; pale brown (10YR 6/3) loam, dark brown (10YR 3/3) moist; moderate thin platy structure; slightly hard, soft, very friable, slightly sticky and slightly plastic; many very fine and few fine roots; many very fine interstitial pores; 5 percent pebbles; mildly alkaline (pH 7.6); clear smooth boundary. (1 to 8 inches thick)

Bt1--4 to 8 inches; pale brown (10YR 6/3) clay loam, dark brown (10YR 4/3) moist; weak medium subangular blocky structure; hard, friable, sticky and plastic; common very fine, few fine and medium roots; many very fine interstitial and few very fine tubular pores; 5 percent pebbles; few thin clay films on faces of peds and lining pores; mildly alkaline (pH 7.6); clear smooth boundary. (0 to 6 inches thick)

Bt2--8 to 18 inches; light yellowish brown (10YR 6/4) clay, dark brown (10YR 3/3) moist; moderate medium angular blocky structure; hard, firm, very sticky and plastic; common very fine roots; common very fine interstitial pores; 10 percent pebbles; many moderately thick clay films on faces of peds

and lining pores; moderately alkaline (pH 7.9); clear smooth boundary. (2 to 6 inches thick)

Btk3--18 to 30 inches; light yellowish brown (10YR 6/4) clay, yellowish brown (10YR 5/4) moist; moderate medium angular blocky structure; very hard, very firm, very sticky and very plastic; common very fine roots; few very fine interstitial pores; 5 percent pebbles; many stress surfaces; few fine filaments of lime; strongly effervescent; moderately alkaline (pH 7.9); clear smooth boundary. (0 to 10 inches thick)

Bqk1--30 to 38 inches; light yellowish brown (10YR 6/4) loam, yellowish brown (10YR 5/4) moist; moderate fine and medium subangular blocky structure; hard, firm and brittle, slightly sticky and slightly plastic; few fine roots; few very fine interstitial pores; 10 percent pebbles; 25 percent, hard, firm, 10 to 20 millimeter durinodes; continuous brittle matrix, lime segregated into common fine filaments, violently effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (6 to 19 inches thick)

Bqk2--38 to 60 inches; very pale brown (10YR 7/3) loam, light yellowish brown (10YR 6/4) moist; massive; hard, firm and brittle, nonsticky and nonplastic; 10 percent pebbles; continuous brittle matrix; few fine filaments of lime; violently effervescent; moderately alkaline (pH 8.4); gradual smooth boundary. (0 to 16 inches thick)

**Type location:** Elko County, Nevada; in an unsectionized area, about 7 miles north of Desert Ranch Reservoir; 41 degrees, 47 minutes, 55 seconds north latitude, 116 degrees, 32 minutes, 52 seconds west longitude.

**Range in Characteristics**

**Soil moisture:** Usually dry; moist from mid fall through spring, dry summer through fall

**Soil temperature:** 47 to 52 degrees F.

**Depth to continuous brittle matrix:** 19 to 30 inches.

**Depth to base of Bt horizons:** 17 to 30 inches.

**Other features:** Gravelly substratum phases are recognized that have variegated colored Bqk horizons with textures of very gravelly loamy sand at a depth of 40 or more inches. The Cqk horizon ranges from 50 to 65 percent pebbles. Some pedons have thin BA horizons.

**Control section:**

Clay content--40 to 55 percent, when mixed.  
 Rock fragments--5 to 35 percent pebbles, when mixed.

**A horizons:**

Value--5 or 6 dry, 3 or 4 moist.  
 Chroma--2 or 3.  
 Structure--Weak to moderate, very thin to very thick platy or subangular blocky.  
 Reaction--Mildly alkaline or moderately alkaline.



**Bt1 horizons (when present):**

Value--5 or 6 dry, 3 or 4 moist.

Chroma--2 or 3.

Structure--Weak or moderate very fine to medium subangular blocky or prismatic.

Consistence--Slightly hard or hard, dry very friable to friable moist, sticky or very sticky and plastic or very plastic wet.

Reaction--Mildly alkaline or moderately alkaline.

**Other Bt horizons:**

Value--5 through 7 dry, 3 through 5 moist.

Chroma--2 through 4 dry, and 3 or 4 moist.

Clay content--40 to 55 percent, when mixed, some pedons have subhorizons with up to 60 percent clay.

Rock fragments--5 to 35 percent pebbles, when mixed.

Structure--Weak or moderate, fine to coarse prismatic or very fine to medium angular blocky.

Reaction--Moderately alkaline or strongly alkaline.

Other features--Some pedons are slightly effervescent to strongly effervescent and commonly have lime filaments in the lower Bt horizons.

**Bqk and Cqk horizons:**

Hue--10YR, 7.5YR or 2.5Y.

Value--6 through 8 dry, 4 through 6 moist.

Chroma--1 through 6.

Texture--Clay loam, sandy clay loam, loam, or sandy loam.

Rock fragments--5 to 35 percent, mainly pebbles.

Consistence--Slightly hard to very hard dry, very friable to firm moist; nonsticky or slightly sticky and nonplastic or slightly plastic, wet.

Effervescence--Slightly effervescent through violently effervescent.

Cementation--Some pedons have thin discontinuous weakly cemented Bqk subhorizons above the continuously brittle horizon.

Gypsum--Is absent in the lower part of some pedons.

Relict Mottles--Present in many pedons at any depth below 30 inches.

Reaction--Moderately alkaline through strongly alkaline.

**Willhill Series**

The Willhill series consists of moderately deep, well drained soils on plateaus. They formed in alluvium and residuum from welded rhyolitic tuff. Slopes are 4 to 15 percent. The mean annual precipitation is about 12 inches, and the mean annual temperature is about 47 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic Durixerollic Haplargids

**Typical pedon:** Willhill gravelly loam, 4 to 15 percent slopes, located in an area of map unit 2783. (Colors are for dry soil unless otherwise noted.)

A--0 to 6 inches; pale brown (10YR 6/3) gravelly loam, brown (10YR 4/3) moist; weak medium subangular blocky structure parting to moderate fine granular; slightly hard, friable, slightly sticky, plastic; many very fine and fine, few medium roots; many very fine tubular and interstitial pores; 20 percent pebbles, 5 percent cobbles; neutral (pH 7.3); gradual wavy boundary. (2 to 6 inches thick)

Bt--6 to 11 inches; yellowish brown (10YR 5/4) very gravelly clay loam, dark yellowish brown (10YR 4/4) moist; moderate fine and medium subangular blocky structure; hard, firm, sticky, plastic; common very fine and fine, few medium roots; common very fine and fine tubular pores; common moderately thick clay films on faces of peds and lining pores; 25 percent pebbles, 10 percent cobbles; mildly alkaline (pH 7.4); gradual wavy boundary. (3 to 8 inches thick)

Bqk1--11 to 17 inches; light yellowish brown (10YR 6/4) extremely cobbly loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, friable, sticky, plastic; common very fine, few fine roots; many very fine, few fine tubular pores; many silica and lime coats on undersides of pebbles; 10 percent pebbles, 60 percent cobbles; strongly effervescent; moderately alkaline (pH 8.1); abrupt irregular boundary. (0 to 28 inches thick)

Bqk2--17 to 23 inches; light yellowish brown (10YR 6/4) extremely cobbly loam, dark yellowish brown (10YR 4/4) moist; massive; hard, firm, sticky and plastic; 80 percent indurated duripan fragments and lenses with a 2 to 10 millimeter laminar cap on fragments; 10 percent pebbles, 60 percent cobbles; strongly effervescent; moderately alkaline (pH 8.2). (6 to 20 inches thick)

R--23 inches; hard fractured rhyolite.

**Type location:** Elko County, Nevada; Owyhee Desert, approximately 43 miles west of Owyhee; 41 degrees, 59 minutes, 28 seconds north latitude, 116 degrees, 55 minutes, 12 seconds west longitude.

**Range in Characteristics**

**Soil moisture:** Usually dry; moist winter and spring, dry June to October

**Soil temperature:** 47 to 53 degrees F.

**Depth to discontinuous pan:** 8 to 34 inches.

**Depth to bedrock:** 21 to 40 inches.

**Control section:**

Clay content--27 to 35.

Rock fragments--35 to 60 percent.

**A horizon:**

Value--5 or 6 dry, 3 or 4 moist.  
 Chroma--2 through 4 dry or moist.  
 Reaction--Neutral or mildly alkaline.

**Bt horizon:**

Value--5 through 7 dry, 4 or 5 moist.  
 Chroma--3 or 4 dry or moist.  
 Texture--Very gravelly clay loam, gravelly clay loam, very cobbly clay loam.  
 Clay content--27 to 35 percent.  
 Rock fragments--35 to 50 percent.  
 Reaction--Neutral or mildly alkaline.

**Bqk horizons:**

Rock fragments--60 to 80 percent mostly cobbles and gravel.  
 Effervescence--Slightly through violently effervescent.  
 Reaction--Moderately or strongly alkaline.

**Wilsor Series**

The Wilsor series consists of deep, well drained soils that formed in residuum and colluvium from tuff with a component of loess and volcanic ash. Wilsor soils are on shoulders of hills. Slopes are 4 to 30 percent. Mean annual precipitation is about 11 inches and the mean annual temperature is about 44 degrees F.

**Taxonomic class:** Fine-loamy, mixed, frigid Durixerollic Haplargids

**Typical pedon:** Wilsor loam, 4 to 15 percent slopes, located in an area of map unit 2741. (Colors are for dry soil unless otherwise noted.)

Al--0 to 2 inches; pale brown (10YR 6/3) loam, dark brown (10YR 3/3); weak medium platy structure; soft, very friable, slightly sticky and slightly plastic; few fine and very fine roots; many fine vesicular pores; 5 percent pebbles; neutral (pH 7.2); abrupt smooth boundary. (2 to 3 inches thick)

A2--2 to 7 inches; brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; weak fine subangular blocky structure; slightly hard, friable, slightly sticky and plastic; few fine and very fine roots; few fine tubular pores; 5 percent pebbles; mildly alkaline (pH 7.4); clear smooth boundary. (4 to 6 inches thick)

Bt1--7 to 12 inches; pale brown (10YR 6/3) clay loam, brown (10YR 4/3) moist; weak coarse prismatic structure parting to moderate medium subangular blocky; hard, firm, sticky and plastic; few fine and very fine roots; few fine tubular pores; common thin clay films on faces of peds and lining pores; 5

percent pebbles; mildly alkaline (pH 7.6); gradual smooth boundary. (4 to 9 inches thick)

Bq--12 to 17 inches; very pale brown (10YR 7/3) loam, brown (10YR 5/3) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and plastic; 20 percent brittle durinodes; 10 percent pebbles; moderately alkaline (pH 8.2); gradual wavy boundary. (0 to 6 inches thick)

Bqk1--17 to 30 inches; very pale brown (10YR 7/3) gravelly loam, pale brown (10YR 6/3) moist; massive; slightly hard, friable, slightly sticky and plastic; 20 percent brittle durinodes; common fine lime in seams; 15 percent pebbles; violently effervescent; strongly alkaline (pH 8.6); gradual smooth boundary. (12 to 14 inches thick)

Bqk2--30 to 46 inches; very pale brown (10YR 8/3) gravelly sandy loam, pale brown (10YR 6/3) moist; massive; soft, friable, slightly sticky and slightly plastic; 15 percent brittle durinodes; common fine lime in seams; violently effervescent; 15 percent pebbles; strongly alkaline (pH 9.0); gradual wavy boundary. (15 to 17 inches thick)

Cr--46 inches; soft weathered tuff bedrock.

**Type location:** Elko County, Nevada; Owyhee Desert, in an unsectionized area, approximately 15 miles northwest of Midas; 41 degrees, 22 minutes, 51 seconds north latitude, 116 degrees, 53 minutes, 27 seconds west longitude.

**Range in Characteristics**

*Soil moisture:* Usually dry; moist in winter and spring, dry from early July through October

*Soil temperature:* 44 to 47 degrees F.

*Depth to Bq or Bqk horizons:* 11 to 20 inches.

**Control section:**

Clay content--25 to 35 percent.

Texture--Loam, clay loam.

Rock fragments--0 to 15 percent, mainly pebbles.

Depth to bedrock--40 to 60 inches.

Depth to lime--14 to 20 inches.

**A horizons:**

Value--3 or 4 moist.

Chroma--2 or 3.

Structure--Thin or medium platy, or subangular blocky in the lower subhorizons only.

**Bt horizon:**

Value--5 or 6 dry.

Chroma--3 or 4.

Clay content--25 to 35 percent.

Rock fragments--0 to 15 percent, mainly pebbles.

**Bq and Bqk horizons:**

Rock fragments--10 to 30 percent, mainly pebbles.



Cementation--Commonly has durinodes in a friable matrix, with some pedons weakly discontinuously silica cemented.

## Xeric Torriorthents

Xeric Torriorthents consists of very shallow, well drained soils that formed in residuum from tuff. The Xeric Torriorthents are on side slopes of hills. Slopes are 15 to 50 percent. The mean annual temperature is about 47 degrees F.

**Taxonomic class:** Xeric Torriorthents

**Typical pedon:** Xeric Torriorthents, 15 to 50 percent slopes, is located in an area of map unit 1855. (Colors are for dry soil unless otherwise noted.)

C--0 to 4 inches; light olive brown (2.5Y 5/4) gravelly fine sandy loam, dark grayish brown (2.5Y 4/2) moist; massive; soft, very friable, nonsticky and nonplastic; many fine interstitial pores; 20 percent pebbles; moderately alkaline (pH 8.0); abrupt smooth boundary. (2 to 10 inches thick)

Cr--4 inches; tuff; lime coating in fractures.

**Type location:** Elko County, Nevada; approximately 12 miles southwest of Midas; about 2,200 feet north and 1,500 feet east of the southeast corner of section 15 T. 38 N., R.44 E.; 41 degrees, 10 minutes, 12 seconds north latitude, 116 degrees, 58 minutes, 35 seconds west longitude.

### Range in Characteristics

**Soil moisture:** Moist winter and spring, dry June through October

**Soil temperature:** 47 to 52 degrees F.

**Depth to paralithic contact:** 4 to 10 inches.

**Texture:** Gravelly fine sandy loam, very gravelly fine sandy loam or gravelly loamy fine sand.

**Control section:**

Rock fragments--15 to 45 percent, mostly pebbles with 0 to 5 percent cobbles.

**C horizon:**

Hue--10YR or 2.5Y.

Value--5 or 6 dry, 3 or 4 moist.

## Yuko Series

The Yuko series consist of very shallow and shallow, well drained soils that formed in residuum and colluvium from andesite, tuff, tuffaceous sandstone and siltstone. Yuko soils are on side slopes of uplands, hills and rock core areas of fan piedmont remnant side slopes. Slopes are 2 to 50 percent. The mean annual precipitation is about 10 inches and the mean annual temperature is about 47 degrees F.

**Taxonomic class:** Loamy, mixed, mesic, shallow Xerollic Haplargids

**Typical pedon:** Yuko sandy loam, 4 to 15 percent slopes, is located in an area of map unit 2778. (Colors are for dry soil unless otherwise noted.)

A1--0 to 2 inches; light brownish gray (10YR 6/2) sandy loam, very dark grayish brown (10YR 3/2) moist; weak platy structure; massive; soft, very friable, nonsticky and nonplastic; many very fine roots; many very fine roots; many very fine and fine, and common medium vesicular pores; 10 percent pebbles, neutral (pH 7.2); abrupt smooth boundary. (2 to 6 inches thick)

A2--2 to 4 inches; light brownish gray (10YR 6/2) loam, dark grayish brown (10YR 4/2) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine and few fine roots; many very fine tubular pores; neutral (pH 7.0); clear wavy boundary. (0 to 3 inches thick)

Bt1--4 to 8 inches; light yellowish brown (10YR 6/2) clay loam, dark brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, firm, slightly sticky and plastic; common fine and few fine roots; few fine and many very fine tubular pores; 10 percent pebbles; many moderately thick clay films lining pores and on faces of peds; moderately alkaline (pH 8.0); abrupt wavy boundary. (3 to 8 inches thick)

Bt2--8 to 14 inches; yellowish brown (10YR 5/4) clay loam, dark brown (10YR 4/3) moist; strong medium subangular blocky structure; hard, firm, sticky and plastic; few very fine roots; few very fine interstitial pores; common moderately thick clay films on faces of peds; moderately alkaline (pH 8.0); abrupt wavy boundary. (0 to 6 inches thick)

2Cr--14 to 20 inches; soft tuff bedrock.

**Type location:** Elko County, Nevada; in an unsectionized area, about 28 miles north of Midas; 41 degrees, 39 minutes, 19 seconds north latitude, 116 degrees, 51 minutes, 42 seconds west longitude.

### Range in Characteristics

**Soil moisture:** Usually moist in winter and spring, dry from June through October

**Soil temperature:** 47 to 52 degrees F.

**Depth to paralithic contact:** 6 to 14 inches.

**Control section:**

Clay content--Averages 27 to 35 percent, with less than 45 percent sand.

Rock fragments--Average 5 to 15 percent, mainly pebbles and cobbles.

**A horizons:**

Value--4 through 6 dry, 3 or 4 moist.

Chroma--2 or 3.

Reaction--Slightly acid or neutral.

**Bt horizons:**

Hue--7.5YR or 10YR.

Value--4 through 6 dry, 3 or 4 moist.

Chroma--3 through 6 dry or moist.

Texture--Dominantly silty clay loam or clay loam.

Clay content--30 to 40 percent.

Rock fragments--Averages less than 15 percent.

Reaction--Slightly acid through moderately alkaline

Other features--Some pedons have a 1 to 4 inch thick clay subhorizon.

## Zevadez Series

The Zevadez series consists of very deep, well drained soils that formed in alluvium from mixed rock sources with a component of loess and volcanic ash. The Zevadez soils are on fan piedmont remnants and plateaus. Slopes are 0 to 8 percent. The mean annual precipitation is about 9 inches and the mean annual temperature is about 47 degrees F.

**Taxonomic class:** Fine-loamy, mixed, mesic Durixerollic Haplargids

**Typical pedon:** Zevadez very fine sandy loam, 0 to 2 percent slopes, located in an area of map unit 2776. (Colors are for dry soil unless otherwise noted.)

A1--0 to 3 inches; light brownish gray (10YR 6/2) very fine sandy loam, very dark grayish brown (10YR 3/2) moist; weak medium platy structure; slightly hard, very friable, slightly sticky, slightly plastic; few very fine roots; many fine vesicular pores; mildly alkaline (pH 7.8); abrupt smooth boundary. (2 to 4 inches thick)

A2--3 to 10 inches; pale brown (10YR 6/3) silt loam, dark brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky, plastic; few fine and very fine roots; common very fine tubular pores; mildly alkaline (pH 7.8); clear smooth boundary. (2 to 7 inches thick)

2Bt--10 to 19 inches; pale brown (10YR 6/3) clay loam, dark brown (10YR 4/3) moist; strong angular blocky structure; hard, firm, sticky, plastic; few fine and very fine roots; few fine and very fine tubular pores; common moderately thick clay films on faces of peds; moderately alkaline (pH 8.4); gradual smooth boundary. (6 to 14 inches thick)

2Bq--19 to 26 inches; pale brown (10YR 6/3) loam, dark brown (10YR 4/3) moist; moderate medium subangular blocky structure; hard, firm, brittle matrix, slightly sticky, slightly plastic; few fine roots; few fine and very fine tubular pores; continuous silica cementation; moderately alkaline

(pH 8.4); abrupt smooth boundary. (5 to 20 inches thick)

3Bqk1--26 to 39 inches; pale brown (10YR 6/3) very fine sandy loam, dark brown (10YR 4/3) moist; massive; very hard, firm, nonsticky, nonplastic; few fine interstitial pores; continuous brittle matrix; 30 percent brittle durinodes; strongly effervescent; lime is in common fine filaments; moderately alkaline (pH 8.0); gradual wavy boundary. (0 to 21 inches thick)

3Bqk2--39 to 60 inches; pale brown (10YR 6/3) very fine sandy loam, dark brown (10YR 4/3) moist; massive; hard, firm, nonsticky, nonplastic; common very fine tubular pores; continuous brittle matrix; 5 percent pebbles; slightly effervescent; moderately alkaline (pH 8.4).

**Type location:** Elko County, Nevada; in an unsectionized area, approximately 1,000 feet south of Silver Lake; 41 degrees, 39 minutes, 44 seconds north latitude, 116 degrees, 40 minutes, 07 seconds west longitude.

### Range in Characteristics

*Soil moisture:* Usually dry; moist in winter and spring, dry early June through November

*Soil temperature:* 47 to 52 degrees F.

*Depth to the base of the argillic horizon and depth to continuous brittle matrix:* 12 to 20 inches.

*Depth to carbonates:* 24 to 36 inches.

**A horizons:**

Value--5 through 7 dry, 3 or 4 moist when mixed, the upper 7 inches averages lighter than 5.5 dry.

Chroma--2 or 3.

Structure--Platy in the upper subhorizon and platy or subangular blocky in lower subhorizons.

Reaction--Neutral to moderately alkaline.

**Bt horizons:**

Value--6 or 7 dry, 4 or 5 moist.

Chroma--2 through 4.

Texture--Sandy clay loam, clay loam or loam.

Clay content--20 to 30 percent.

Rock fragments--0 to 15 percent.

Structure--Subangular blocky or angular blocky.

Consistence--Very friable to firm, moist; slightly sticky or sticky and slightly plastic or plastic, wet.

Reaction--Mildly alkaline or moderately alkaline.

**Bq horizon:**

Value--6 or 7 dry, 4 or 5 moist.

Chroma--3 or 4.

Texture--Fine sandy loam or very fine sandy loam; clay loam is common in some pedons.

Clay content--12 to 30 percent.

Rock fragments--0 to 15 percent, mainly pebbles.

Structure--Massive with platy or subangular blocky common in some pedons.



Consistence--Hard or very hard, dry, slightly sticky or sticky and slightly plastic or plastic, wet.

Cementation--Continuous brittle matrix with up to 40 percent durinodes in a firm and brittle matrix.

**Bqk horizons:**

Hue--10YR or 2.5Y.

Value--6 through 8 dry, 4 or 5 moist.

Chroma--2 through 4.

Texture--Loamy sand, loamy fine sand, fine sandy loam or very fine sandy loam.

Clay content--8 to 12 percent.

Rock fragments--0 to 15 percent, mainly pebbles.

Consistence--Slightly hard to very hard dry, and friable or firm moist.

Reaction--Mildly alkaline or moderate alkaline.

Effervescence--Slightly or strongly.

Other features--20 to 60 percent durinodes in a friable matrix or has a continuous brittle matrix.

# Formation of the Soils

---

This section relates the soils in the survey area to the major factors of soil formation.

Soil is a natural body on the earth's surface in which plants grow. It is a mixture of varying proportions of mineral material, organic matter, water, and air. The mineral material is variable in size and is partly or wholly weathered. Soils have distinctive layers, or horizons, that are the product of environmental forces acting upon material deposited or accumulated through geologic activity.

Soils differ from one another in different localities and within short distances. The differences are the result of the interaction of five soil-forming factors to the kind of soil that develops. These factors are (1) climate, mainly the temperature and kind and amount of precipitation that have existed since accumulation of the parent material; (2) topography or relief, mainly as it affects the internal and external soil properties, such as drainage, aeration, susceptibility to erosion, and exposure to sun and wind; (3) biological forces, including the plant cover and the organisms living in and on the soil; (4) parent material, including texture and structure of the material as well as its mineralogical and chemical composition; and (5) the length of time that the other soil-forming factors have been active.

In general, the landscape of the area is comprised mainly of mountains and valleys that are the result of geologic stratigraphic and structural control. The present topography and landforms, however, are primarily the result of events during Quaternary time. The kinds of soil that formed are indicative of the stability and age of the surfaces of the landforms on which they occur.

## Climate

The climate of the survey area is characterized by warm, dry summers and cool, moist winters. The average annual precipitation ranges from about 7 inches in the lowest elevations of the western part of the survey area to about 20 inches or more at the highest elevations in Tuscarora and Bull Run Mountains. The average annual air temperature ranges from about 50 degrees F in the lower elevation areas to

about 40 degrees F or lower in some of the high mountain ranges. Major climatic variations are the result of the effects of topography relief. Temperature decreases with increasing elevation. Precipitation increases with increasing elevation and is highest in the mountainous areas. As a consequence, the soils in the survey area reflect a general zonation with respect to elevation and latitudinal location.

At the lower elevations of 4,500 to 5,400 feet within the survey area, the average annual precipitation is about 7 to 8 inches. In this arid part of the area, weathering of parent material is slow, leaching is incomplete, and eluviation and illuviation proceed at a very slow rate. The plant cover is sparse and consists mainly of drought and salt-tolerant shrubs. Typically, the soils are low in organic matter content, and have a thin light colored A horizon. Soluble salts and calcium carbonate accumulate in the soil profile at a relatively shallow depth. Duric Haplargids (Kortty series), Duric Camborthids (Weso series), and Typic Durorthids (Sodhouse series) characterize soils that reflect soil formation in this climatic zone.

With increasing elevation, there is an accompanying increase in precipitation which results in deeper leaching of salts and calcium carbonate, and a thicker and darker A horizon. Haploxerollic Durorthids (Shabliss series), and Durixerollic Camborthids (Clurde, Enko and Orovada series) represent soils formed at lower elevations where precipitation is about 10 inches. Aridic Durixerolls (Stampede series), and Abruptic Aridic Durixerolls (Donna series) are examples of soils that have formed at mid-elevation in this zone.

At the highest elevations, up to about 8,500 feet, precipitation is 12 to over 16 inches. Leaching of salts and carbonates is more intensive. The soils are neutral or slightly acid with a thick A horizon that is high in organic matter content. Pachic Haploxerolls (Shively series), Pachic Cryoborolls (Hapgood series), and Argic Pachic Cryoborolls (Tusel series) are typical of these soils.

In winter, freezing and thawing generally occur throughout the survey area, except in those areas that generally are insulated by snow cover. The effects of frost action are discernible by the heaving of plants, development of miniature stone rings, and erosion of the surface soils. At some of the higher elevations,



freezing and thawing has fractured and displaced the bedrock.

## Living Organisms

Plants, animals, insects, and microorganisms are important biological forces that affect soil formation in the survey area. Animals, such as badgers and ground squirrels, and insects, such as cicadas, have had some effect on soil development, although plants and various microorganisms appear to have been the major biological influence on the soils in this survey area.

The vegetation in the area has been a particularly important factor in reducing erosion. This factor has helped to maintain the stability of the land surfaces so that normal soil formation could take place.

Because of climatic differences, plants vary considerably in kinds and amounts with differences in landform and elevation. On flood plains, stream terraces and inset fans at low elevations, the main plants are drought and salt-tolerant shrubs and grasses. Because of the scarcity of available moisture, plants cover only a small part of the surface. Therefore, very little organic matter is added to the soil and the scarcity of plants or litter provides little protection from the wind and sun. This is common on the Aquic Xerofluvents (Placeritos series) and Duric Camborthids (Creemon and Relley series).

On the flood plains where drainage is restricted, the dense growth of meadow vegetation has supplied the organic matter that gives the Cumulic Haplaquolls (Crooked Creek series) a thick, dark-colored A horizon.

The piedmonts and low hills at low and medium elevations support a plant cover of shrubs and grass that is transitional from desert shrubs. The density of plants increases gradually with elevations and soluble salts are deeper in the soil profile. The A horizons of these soils have accumulated slight to moderate amounts of organic matter depending on soil stability. Xerollic Durargids (Hunnton series) and Aridic Argixerolls (Cotant series) are typical of these soils.

The mountainous areas support fairly dense stands of shrubs, grasses, and in some places, trees. Because of the more abundant vegetation, the A horizons of most of the soils, such as the Pachic Cryoborolls (Hapgood series), are thick, high in organic matter, and dark in color.

## Topography

Topography, through its effects on drainage, runoff, erosion, and exposure to the sun and wind, has had an important effect on soil formation in the survey area. The mountain ranges, valleys, and flood plains reflect the gross variations in relief within the area.

The mountain ranges are mainly characterized by excessive relief. Runoff is rapid or very rapid, and the hazard of erosion is high. The removal of material by erosion inhibits or prevents soil development. Development in soils on unstable mountain surfaces that are subject to a high rate of geologic erosion is primarily limited to accumulation of organic matter to form a dark-colored A horizon. A cambic or an argillic horizon has formed in the soils on more stable mountain surfaces where the rate of geologic erosion has been slower. Lithic Xerollic Haplargids (Soughe series) and Aridic Calcic Argixerolls (Carstump series) are examples of soils that formed on the more stable mountain slopes and have an argillic horizon. Lithic Haploxerolls (Gando series) are examples of soils on less stable mountain slopes where soil formation has been unable to act on parent material long enough for calcic or argillic horizons to develop.

Concave and northfacing mountain slopes commonly have snow pockets that remain into late spring and early summer. The effect of temperature and moisture is enhanced in these areas resulting in dense stands of shrubs and grass. The soils in these areas have developed a thick, dark-colored A horizon with a high content of organic matter. Pachic Cryoborolls (Hapgood series) are examples of these soils.

The valleys receive drainage water primarily from the surrounding mountain ranges. Within the survey area, the valleys are characterized by a series of level or nearly level basin floors bordered by a piedmont slope consisting of alluvial fans, fan skirts, and fan piedmonts remnants (16). They consist of Tertiary-Quaternary valley-fill material (4). Small playas or intermittent lakes are located in the Owyhee Desert.

In Independence Valley, Squaw Valley, the valley along Evans Creek, and the Owyhee Desert areas, stream erosion has dissected parts of the alluvial fill. Downcutting has been interrupted several times and these events are marked by the development of fan piedmonts. The dissection patterns in some of these areas have resulted in fan piedmont remnant summits

and sideslopes with inset fans and flood plains along drainageways. The fan piedmont areas have been relatively stable over a long period of time as a result of the bypassing of drainage water from hills and mountains through dissecting channels. Xerollic Durargids (Hunnton series), Xerollic Durorthids (Chiara series), and Durixerollic Haplargids (Wieland series) are examples of soils on stable fan piedmont remnants. Durixerollic Camborthids (Orovada series), drained Cumulic Haplaquolls (Welch series), and Cumulic Haplaquolls (Crooked Creek series) are examples of soils on inset fans and flood plains.

Associated with Independence Valley are low hills bordering the mountains. They are strongly dissected and consist of low hill crests and sideslopes. Aridic Argixerolls (Cotant series) and Lithic Argixerolls (Graley series) are examples of soils found on the low hills.

The nearly level axial-stream flood plains along the South Fork of the Owyhee River in Independence Valley have a high water table. Runoff is very slow and some of the soils are subject to flooding. The soils in these areas support dense stands of meadow vegetation that have contributed a large amount of organic matter to the soils, producing a dark-colored A horizon. Cumulic Haplaquolls (Crooked Creek series) are examples of these soils. In some areas, where stream channel entrenchment is common, the water table is at a greater depth. The soils in these areas support good stands of irrigated meadow vegetation. These soils also have dark-colored A horizons. The drained Cumulic Haplaquolls (Clementine series) are examples of soils found on flood plains where channel entrenchment is common along Rock Creek and Willow Creek in Squaw Valley.

## Parent Material

Parent material is the weathered rock or unconsolidated material from which soils form. The hardness, grain size, and porosity of the parent material and its mineralogical and chemical composition greatly influence soil formation. The main sources of parent material in the survey area are intrusive and extrusive igneous rock, sedimentary rock, and colluvium and alluvium, including loess and volcanic ash. Minor amounts of metasedimentary and metavolcanic rocks are common in localized areas.

The igneous rock of the hills and mountains of the survey area includes andesite, rhyolite, and welded and non-welded tuff. Volcanic rock contains appreciable quantities of minerals that weather to clay. The more siliceous rock, particularly tuff, is also a source of silica for the cementation of soil horizons. Because of the

ability of material derived from volcanic rock to produce clay upon weathering, soils that formed in this material on sufficiently stable landforms for long periods of time have developed argillic horizons. Aridic Argixerolls (Sumine series), Lithic Argixerolls (Cleavage series), Xerollic Durargids (Hunnton series), and Lithic Xerollic Haplargids (Bregar series) are examples of these soils.

Colluvium has accumulated on steep mountain slopes as a result of gravitational forces and is soil parent material. The colluvium generally is poorly sorted, contains many rock fragments, and frequently includes minerals that weather to clay. Many of the colluvial landscapes have not been stable long enough for an argillic horizon to have formed in soils such as the Pachic Cryoborolls (Hapgood and Hackwood series).

Paleozoic sedimentary and metasedimentary rocks occur primarily in the Tuscarora Mountains and the Columbia Basin. This bedrock consists of relatively thick sequences of chert, shale, siltstone, sandstone, quartzite, and conglomerate. Aridic Argixerolls (Rugar series) are examples of soils that have developed argillic horizons in this material.

Late Tertiary and early Quaternary sedimentary and metasedimentary rocks occur primarily in the Tuscarora Mountains and the Snowstorm Mountains. The bedrock consists primarily of older alluvium and lakebed deposits containing interbedded tuffaceous shale, tuffaceous sandstone, siltstone, and mudstone. Xeric Torriorthents (Puett series) and Lithic Torriorthents (Puett variant) are examples of shallow undeveloped soils on unstable surfaces where soil formation is minimal.

Alluvium deposited on fan piedmont remnants, inset fans, fan aprons, fan skirts, alluvial fans, alluvial flats, and flood plains consists mostly of silty, loamy, and clayey material of generally mixed mineralogy that has been eroded from surrounding hills and mountains.

Alluvium deposited from mixed rock sources on fan piedmonts, fan aprons, and fan skirts are mostly loamy textured and generally contain pebbles, cobbles, and stones. It is porous and contains minerals that, when weathered, produce clay and soluble silica for cementation of duripans. Xerollic Durargids (Hunnton series) and Aridic Durixerolls (Stampede series) are examples of soils with an argillic horizon and silica cementation that formed on stable fan piedmont remnants. Durixerollic Camborthids (Orovada series) are examples of soils with a cambic horizon and some silica cementation on fan aprons and fan skirts.

Alluvium deposited on flood plains consists of silty and clayey material. Although these materials contain weatherable minerals, the soils are young and exhibit little soil development. Aeris Fluvaquents (Sonoma



series) and Fluvaquentic Haplaquolls (Humboldt series) are examples of these soils.

Volcanic ash has been instrumental as a source of silica in the formation of durinodes and duripans in the soils of the area. Volcanic ash has been preserved in some of the soils on fan skirts, inset fans, stream terraces, and adjacent flood plains. These occur as strata. Duric Camborthids (Creemon series) on stream terraces and Duric Camborthids (Relley series) on inset fans are examples of soils influenced by volcanic ash.

## Time

Time is required for the formation of soil horizons. The amount of time required depends upon the other soil-forming factors. Thickness and other characteristics of surface and subsoil horizons and of other horizons reflect the relative age of soils (10). The age of the soil horizons reflects the amount of weathering of parent material resulting from the interaction of moisture, temperature, biological activity, and the local relief.

The soils in this survey area range from a few years to, possibly, many thousands of years in age. This range in age is a major reason for the many kinds of soil in the area.

The influence of time and other soil-forming factors are not well understood by soil scientists and geologists working in this field. Many soil scientists and some geologists feel that weathering of parent material and soil profile development have been essentially continuous, with little change in rate, throughout Quaternary time (14), (15), (17), (21).

Recently, geologists concerned with differentiating Quaternary deposits have proposed that soil development has not proceeded continuously at the same rate, but has taken place intermittently at rapid rates (11), (12), (13), (17). These geologists have developed the technique of mapping soil stratigraphic units which use weathering profiles as stratigraphic markers to differentiate and correlate Quaternary deposits. The concept of soil development is based on the assumption that weathering profiles formed in response to infrequent combinations of climatic factors that induces minimal erosion and deposition and a greatly accelerated rate of chemical weathering.

Although disagreements exist in regard to the relative influences of time and other soil-forming factors, the concept of intermittency of soil formation has been supported by numerous studies and provides a practical technique to discuss the age of soil in the survey area in relation to geologic climatic units in Quaternary time. For the purpose of this discussion,

time-stratigraphic names will be as set forth by Birkeland (3). These are Holocene (0-10,000 years), Late Wisconsin (10,000 - 30,000 years), Middle Wisconsin (30,000 - 40,000 years), Early Wisconsin (40,000 - 130,000 years), and Pre-Wisconsin (130,000+ years).

The kinds of diagnostic subsurface horizons and other subsurface diagnostic properties (20), (18), together with their strength of expression, provide general clues to the age of the soils in the area. Important subsurface diagnostic horizons present in soils within the area include argillic, natric, and cambic horizons, and horizons exhibiting silica cementation.

Strongly expressed argillic horizons in this area generally occur in soils that formed primarily during Wisconsin and Pre-Wisconsin. This concept has been established by studies in the Southwest (6), (7), and is further supported in Soil Taxonomy (20). With increasing age and constancy of other conditions, argillic horizons become finer in texture, become somewhat thicker, and tend to develop abrupt upper boundaries. Weakly expressed, thin argillic horizons may have formed during very Late Wisconsin or Early Holocene time.

Natric horizons are special kinds of argillic horizons that formed under the influence of high exchangeable sodium content. The effect of sodium on the dispersion of clay may tend to accelerate the rate of formation of argillic horizons. This is not believed to be significant, however, except in weakly expressed natric horizons that formed on Holocene surfaces. Following earlier development as argillic horizons, prominent natric horizons may have developed their present characteristics as a result of sodium supplied from eolian deposits. Transportation and deposition of sodium salts with eolian deposits are believed to be an important present day process that affects the physical and chemical properties of soils in the area.

The volcanic glass in sediment derived from pyroclastic material and in alluvial and eolian deposits of volcanic ash is a source of silica for the formation of duripans and durinodes in many of the soils in the survey area. Duripans are massive or platy horizons that are cemented with silica, and in most instances, with accessory carbonates. Because of their association with prominent argillic horizons, massive duripans capped with silica and lime cemented laminar layers are probably the oldest kind of duripan in the area and are of Pre-Wisconsin age. Thin duripans lacking overlying laminar layers, weak discontinuous silica cementation, and/or durinodes have apparently developed on Holocene surfaces in loess or loamy alluvium generally deposited on gravelly material. These forms of silica cementation apparently are

capable of forming during a relatively short period of time.

The degree of development of diagnostic subsurface horizons in the soils of the area indicates a sequence of soils that ranges in age from present time to Pre-Wisconsin.

The youngest soils in the area are those that formed in recently aggraded material or in material recently exposed by erosion. Included among these soils are Aeris Fluvaquents (McCleary and Tweba series) and Aquic Xerofluvents (Placeritos series) formed in recent alluvium; and shallow Xeric Torriorthents (Puett series) formed in Tertiary sediments on low hills where geologic erosion has been active.

Somewhat older than these soils are those soils that formed in alluvium on wet flood plains, slowly aggrading inset fans and soils on relatively recently eroded mountain slopes. These soils have been stable long enough to have accumulated organic matter and formed a dark-colored A horizon. They do not have an argillic, natric, cambic, or calcic horizon. Cumulic Haplaquolls (Crooked Creek series) are examples of soils that formed on wet flood plains. Aridic Haploxerolls (Loncan series) and Pachic Cryoborolls (Hapgood series) are examples of soils that formed on mountain slopes.

Stable Holocene land surfaces less than about 10,000 years and more than 2,000 years old are extensive in the survey area. The soils that formed on these surfaces have a cambic horizon. Original stratification is absent, and carbonates and some silica have been removed and redeposited in underlying horizons. Investigations in southern New Mexico indicate that cambic horizons in that region are less than about 5,000 years old (5), (8). Cambic horizons in the survey area and in other areas in Nevada have been generally thought to be less than 10,000 years old, and possibly less than 7,000 years. This age has been determined mostly as a result of soil mapping in areas located below the last high stage of Pleistocene Lake Lahontan (9), (11), (12), (13). Durixerollic Camborthids (Clurde and Orovada series) are examples of soils with cambic horizons on inset fans.

The soils in some areas have been stripped by erosion during the Late Wisconsin exposing relict duripans. Subsequent redeposition, during middle to early Holocene, of loess and loamy alluvium derived from

surrounding land surfaces covered these relict subsurface horizons to a shallow depth. Soil development of the surface alluvium is minimal. Typical Durorthids (Sodhouse series) and Xerollic Durorthids (Chiara series) are examples of these soils on fan piedmont remnants.

Soils that have a relict argillic horizon are believed to be of Late Wisconsin to Pre-Wisconsin age. These soils occur extensively on mountains, hills, and fan piedmonts. The fact that extensive areas of these kinds of soils exist today is evidence that major erosional and depositional events have not taken place in the area since late Pleistocene time.

Stable Late Wisconsin or Middle Wisconsin land surfaces are extensive. Soils on these surfaces have dominantly fine-loamy or loamy-skeletal argillic horizons. Durixerollic Haplargids (Zevadez series) are examples of soils with argillic horizons on hill and mountain slopes. Pachic Argixerolls (Bullump series) are examples of soils on mountain slopes.

During this same period, thin and moderately thick duripan were formed in some soils with argillic horizons on the older landscapes of the area. Haploxerollic Durargids (Cherry Spring series) are examples of these soils on fan piedmont remnants.

Stable Early Wisconsin or Early-Middle Wisconsin land surfaces are extensive. These soils have well developed, fine textured argillic horizons. They occupy older, stable land surfaces where the original subsurface horizons have been neither stripped by erosion or deeply buried by sediment. Aridic Durixerolls (Stampede series) and Xerollic Durargids (Hunton series) are examples of such soils on fan piedmont remnants. Aridic Argixerolls (Quarz series) are examples of these soils on mountain slopes.

Stable very Early Wisconsin and Pre-Wisconsin surfaces are moderately extensive in the area. Soils on these surfaces are relatively stable, deeply dissected, and have fine and very fine textures with an argillic horizon that has an abrupt upper boundary. It is because of these characteristics that these soils are considered to be the oldest in the area. Abruptic Aridic Durixerolls (Donna series) are examples of these soils on fan piedmont remnants. Aridic Palexerolls (Pie Creek series) and Xerollic Paleargids (Mahala series) are examples of these soils on hill slopes.





# References

---

- (1) American Association of State Highway and Transportation Officials. 1986. Standard specifications for highway materials and methods of sampling and testing. Ed. 14, 2 vols.
- (2) American Society for Testing and Materials. 1993. Standard classification of soils for engineering purposes. ASTM Stand. D 2487.
- (3) Birkland, Peter W. 1974. Pedology, weathering, and geomorphologies research.
- (4) Carlson J.E., and Stewart J.H. 1978 Geologic Map of Nevada, United States Geological Survey in cooperation with the Nevada Bureau of Mines and Geology.
- (5) Gile, L. H. 1966. Cambic and certain noncambic horizons in desert soils of southern New Mexico. Soil Sci. Soc. of Am. Proc., vol 30: 773-781.
- (6) Gile, L. H. and R. B. Grossman. 1968. Morphology of the argillic horizon in desert soils of southern New Mexico. Soil Sci. Vol. 106, no. 1: 6-15.
- (7) Gile, L. H. and J. W. Hawley. 1966. Periodic sedimentation and soil formation on an alluvial fan piedmont in southern New Mexico. Soil Sci. Soc. of Am. Proc., vol. 30: 261-268
- (8) Gile, L. H., F. F. Peterson, and R. B. Grossman. 1966. Morphological and genetic sequences of carbonate accumulation in desert soils. Soil Sci., vol. 101: 347-360
- (9) Hawley, J. W. 1962. The late Pleistocene and recent geology of the Winnemucca segment of the Humboldt River Valley, Nevada. Ph.D. thesis, University of Illinois.
- (10) Hawley, J. W. and L. H. Gile. 1966. Landscape Evolution and Soil Genesis in the Rio Grande Region, Southern New Mexico. Guidebook; 11th Annual Field Conference, Rocky Mountain Section, Friends of the Pleistocene, Aug 26-28, 1966.
- (11) Morrison, R. B. 1964. Lake Lahontan: Geology of the Carson Desert, Nevada. U.S. Geol. Surv. Prof. Pap. 401.
- (12) Morrison, R. B. 1964. Soil stratigraphy: Principles, applications to differentiation and correlation of Quaternary deposits and landforms, and applications to soil science. Ph.D. thesis, University of Nevada.
- (13) Morrison, R. B. 1965. Principles of Quaternary soil stratigraphy. In Quaternary soils, INQA. Proc, vol. 9, VII Congress: 1-69.
- (14) Nikiforoff, C. C. 1942. Fundamental formula of soil formation. Am. J. of Sci., vol. 240: 847-866.
- (15) Nikiforoff, C. C. 1949. Weathering and soil evolution. Soil Sci., vol. 67: 219-223.
- (16) Peterson, Frederick F. 1981. Landforms of the Basin and Range province defined for soil survey. Nevada Agricultural Experiment Station, Max C. Fleischmann College of Agriculture, University of Nevada, Reno. Tech. bul. 28: 52 pp., illus.
- (17) Richmond, G. M. 1962. Quaternary geology of the La Sal Mountains, Utah. U. S. Geol. Surv. Prof. Pap. 324.
- (18) United States Department of Agriculture. 1951. Soil survey manual. U.S. Dep. Agric. Handb. 18, (Supplements replacing pp. 173-188 issued May 1962.)
- (19) United States Department of Agriculture. 1961. Land capability classification. U.S. Dep. Agric. Handb. 210.
- (20) United States Department of Agriculture. 1975. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. Soil Conserv. Serv., U.S. Dep. Agric. Handb. 436.
- (21) Ward, W. T. 1965. Soils of the Adelaide Area, South Australia, in relation to time. In Quaternary soils, INQA. Proc., vol. 9, VII Congress: 293-306.





# Glossary

---

**Aeration, soil.** The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

**Aggregate, soil.** Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

**Alkali (sodic) soil.** A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

**Alluvial cone.** The material washed down the sides of mountains and hills by ephemeral streams and deposited at the mouth of gorges in the form of a moderately steep, conical mass descending equally in all directions from the point of issue.

**Alluvial fan.** The fanlike deposit of a stream where it issues from a narrow valley upon a plain, or of a tributary stream near or at its junction with its main stream.

**Alluvial flat.** A nearly level, graded, alluvial surface in bolsons and semi-bolsons. Commonly, an alluvial flat does not manifest terraces or floodplain levels.

**Alluvium.** Material, such as sand, silt, or clay, deposited on land by streams.

**Alpha,alpha-dipridyl.** A dye that when dissolved in 1N ammonium acetate is used to detect the presence of reduced iron (Fe II) in the soil. A positive reaction indicates a type of redoximorphic feature.

**Animal unit month (AUM).** The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

**Aquic conditions.** Current soil wetness characterized by saturation, reduction, and redoximorphic features.

**Area reclaim** (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

**Argillic horizon.** A subsoil horizon characterized by an accumulation of illuvial clay.

**Argillite.** Weakly metamorphosed mudstone or shale.

**Arroyo.** The flat-floored channel of an ephemeral stream, commonly with very steep to vertical banks cut in alluvium.

**Aspect.** The direction in which a slope faces.

**Association, soil.** A group of soils or miscellaneous areas geographically associated in a characteristic

repeating pattern and defined and delineated as a single map unit.

**Available water capacity (available moisture capacity).**

The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

Very low.....	0 to 3.5
Low .....	3.5 to 5
Moderate .....	5 to 7.5
High.....	more than 7.5

**Avalanche chute.** The track or path formed by an avalanche.

**Back slope.** The geomorphic component that forms the steepest inclined surface and principal element of many hillsides. Back slopes in profile are commonly steep, are linear, and may or may not include cliff segments.

**Backswamp.** A flood-plain landform of extensive, marshy, or swampy, depressed areas of floodplains between natural levees and valley sides or terraces.

**Badland.** Steep or very steep, commonly nonstony, barren land dissected by many intermittent drainage channels. Badland is most common in semiarid and arid regions where streams are entrenched in soft geologic material. Local relief generally ranges from 25 to 500 feet. Runoff potential is very high, and geologic erosion is active.

**Ballena.** A fan remnant having a distinctively-rounded surface of fan alluvium. The ballena's broadly rounded shoulders meet from either side to form a narrow summit and merge smoothly with concave, short pediments which form smoothly-rounded drainageways between adjacent ballenas. A partial ballena is a fan remnant large enough to retain some relict fan surface on a remnant summit.

**Barrier beach.** A wide gently sloping portion of a bolson floor comprising numerous, parallel, relict longshore-bars and lagoons built by a receding pluvial lake.

**Basal area.** The area of a cross section of a tree, generally referring to the section at breast height and measured outside the bark. It is a measure of stand density, commonly expressed in square feet.



**Base saturation.** The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, K), expressed as a percentage of the total cation-exchange capacity.

**Basin floor.** A general term for the nearly level, lower-most part of intermontane basins (i.e., bolson, semi-bolsos). The basin floor includes all of the alluvial, eolian, and erosional landforms below the piedmont slope.

**Beach terrace.** The relict shorelines from pluvial lakes, generally restricted to valley sides.

**Bedding planes.** Fine strata, less than 5 millimeters thick, in unconsolidated alluvial, eolian, lacustrine, or marine sediment.

**Bedding system.** A drainage system made by plowing, grading, or otherwise shaping the surface of a flat field. It consists of a series of low ridges separated by shallow, parallel dead furrows.

**Bedrock.** The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

**Bedrock-controlled topography.** A landscape where the configuration and relief of the landforms are determined or strongly influenced by the underlying bedrock.

**Bench terrace.** A raised, level, or nearly level strip of earth constructed on or nearly on a contour, supported by a barrier of rocks or similar material, and designed to make the soil suitable for tillage and to prevent accelerated erosion.

**Bisequum.** Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.

**Blowout.** A shallow depression from which all or most of the soil material has been removed by wind. A blowout has a flat or irregular floor formed by a resistant layer or by an accumulation of pebbles or cobbles. In some blowouts, the water table is exposed.

**Board foot.** A unit of measure of the wood in lumber, logs, or trees. The amount of wood in a board one foot wide, one foot long, and one inch thick before finishing.

**Bolson.** A landscape term for an internally drained intermontane basin into which drainages from surrounding mountains converge inward toward a central depression.

**Boulders.** Rock fragments larger than 2 feet (60 centimeters) in diameter.

**Breaks.** The steep and very steep broken land at the border of an upland summit that is dissected by ravines.

**Breast height.** An average height of 4.5 feet above the ground surface; the point on a tree where diameter measurements are ordinarily taken.

**Brush management.** Use of mechanical, chemical, or biological methods to make conditions favorable for reseeding or to reduce or eliminate competition from woody vegetation and thus allow understory grasses and forbs to recover. Brush management

increases forage production and thus reduces the hazard of erosion. It can improve the habitat for some species of wildlife.

**Butte.** An isolated small mountain or hill with steep or precipitous sides and a top variously flat, rounded, or pointed that may be a residual mass isolated by erosion or an exposed volcanic neck.

**Calcareous soil.** A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

**Caldera.** A large, more or less circular depression, formed by explosion and/or collapse, which surrounds a volcanic vent or vents, and whose diameter is much greater than that of the included vent, or vents.

**Caliche.** A more or less cemented deposit of calcium carbonate in soils of warm-temperate, subhumid to arid areas. Caliche occurs as soft, thin layers in the soil or as hard, thick beds directly beneath the solum, or it is exposed at the surface by erosion.

**California bearing ratio (CBR).** The load-supporting capacity of a soil as compared to that of a standard crushed limestone, expressed as a ratio. First standardized in California. A soil having a CBR of 16 supports 16 percent of the load that would be supported by standard crushed limestone, per unit area, with the same degree of distortion.

**Canopy.** The leafy crown of trees or shrubs. (See Crown.)

**Canyon.** A long, deep, narrow, very steep sided valley with high, precipitous walls in an area of high local relief.

**Capillary water.** Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

**Catena.** A sequence, or "chain," of soils on a landscape that formed in similar kinds of parent material but have different characteristics as a result of differences in relief and drainage.

**Cation.** An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

**Cation-exchange capacity.** The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

**Channeled.** Refers to a drainage area in which natural meandering or repeated branching and convergence of a streambed have created deeply incised cuts, either active or abandoned, in alluvial material.

**Channery soil material.** Soil material that is, by volume, 15 to 35 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as

much as 6 inches (15 centimeters) along the longest axis. A single piece is called a channer.

**Chemical treatment.** Control of unwanted vegetation through the use of chemicals.

**Chiseling.** Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard, compacted layers to a depth below normal plow depth.

**Clay.** As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

**Clay depletions.** Low-chroma zones having a low content of iron, manganese, and clay because of the chemical reduction of iron and manganese and the removal of iron, manganese, and clay. A type of redoximorphic depletion.

**Clayey soil.** Silty clay, sandy clay, or clay.

**Clay film.** A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

**Claypan.** A slowly permeable soil horizon that contains much more clay than the horizons above it. A claypan is commonly hard when dry and plastic or stiff when wet.

**Clearcut.** A method of forest harvesting that removes the entire stand of trees in one cutting. Reproduction is achieved artificially or by natural seeding from adjacent stands.

**Climax plant community.** The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

**Closed depression.** A low area completely surrounded by higher ground and having no natural outlet.

**Coarse fragments.** Mineral or rock particles larger than 2 millimeters in diameter.

**Coarse textured soil.** Sand or loamy sand.

**Cobble (or cobblestone).** A rounded, partly rounded or angular fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

**Cobbly soil material.** Material that is 15 to 35 percent, by volume, rounded or partially rounded rock fragments 3 to 10 inches (7.6 to 25 centimeters) in diameter. Very cobbly soil material is 35 to 60 percent of these rock fragments, and extremely cobbly soil material is more than 60 percent.

**Codominant trees.** Trees whose crowns form the general level of the forest canopy and that receive full light from above but comparatively little from the sides.

**Colluvium.** Unconsolidated, unsorted earth material moved and deposited by mass movement on sideslopes and at the base of slopes.

**Commercial forest.** Forest land capable of producing 20 cubic feet or more per acre per year at the culmination of mean annual increment.

**Complex slope.** Irregular or variable slope. Planning or establishing terraces, diversions, and other water-control structures on a complex slope is difficult.

**Complex, soil.** A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

**Compressible** (in tables). Excessive decrease in volume of soft soil under load.

**Concretions.** Cemented bodies with crude internal symmetry organized around a point, a line, or a plane that typically takes the form of concentric layers visible to the naked eye. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up concretions. If formed in place, concretions of iron oxide or manganese oxide are generally considered a type of redoximorphic concentration.

**Conglomerate.** A coarse grained, clastic rock composed of rounded to subangular rock fragments more than 2 millimeters in diameter. It commonly has a matrix of sand and finer textured material. Conglomerate is the consolidated equivalent of gravel.

**Conservation cropping system.** Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, the soil-improving crops and practices more than offset the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.

**Conservation tillage.** A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

**Consistence, soil.** Refers to the degree of cohesion and adhesion of soil material and its resistance to deformation when ruptured. Consistence includes resistance of soil material to rupture and to penetration; plasticity, toughness, and stickiness of puddled soil material; and the manner in which the soil material behaves when subject to compression. Terms describing consistence are defined in the "Soil Survey Manual."

**Contour stripcropping.** Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

**Control section.** The part of the soil on which classification is based. The thickness varies among different kinds of soil, but, for many, it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

**Coprogenous earth (sedimentary peat).** Fecal material deposited in water by aquatic organisms.



**Corrosion.** Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.

**Cover crop.** A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

**Cropping system.** Growing crops according to a planned system of rotation and management practices.

**Crop residue management.** Returning crop residue to the soil, which helps to maintain soil structure, organic matter content, and fertility, and helps to control erosion.

**Cross-slope farming.** Deliberately conducting farming operations on sloping farmland in such a way that tillage is across the general slope.

**Crown.** The upper part of a tree or shrub, including the living branches and their foliage.

**Cuesta.** A hill or ridge that has a gentle slope on one side and a steep slope on the other; specifically, an asymmetric, homoclinal ridge capped by resistant rock layers of slight or moderate dip.

**Culmination of the mean annual increment (CMAI).** The average annual increase per acre in the volume of a stand. Computed by dividing the total volume of the stand by its age. As the stand increases in age, the mean annual increment continues to increase until mortality begins to reduce the rate of increase. The point where the stand reaches its maximum annual rate of growth is called the culmination of the mean annual increment.

**Cutbanks cave** (in tables). The walls of excavations tend to cave in or slough.

**Decreasers.** The most heavily grazed climax range plants. Because they are the most palatable, they are the first to be destroyed by overgrazing.

**Deep soil.** A soil that is 40 to 60 inches deep over bedrock or to other material that restricts the penetration of plant roots.

**Deferred grazing.** Postponing grazing or resting grazing land for a prescribed period.

**Delta.** A body of alluvium having a surface that is nearly flat and fan shaped; deposited at or near the mouth of a river or stream where it enters a body of relatively quiet water, generally a sea or lake.

**Dense layer** (in tables). A very firm, massive layer that has a bulk density of more than 1.8 grams per cubic centimeter. Such a layer affects the ease of digging and can affect filling and compacting.

**Depth, soil.** Generally, the thickness of the soil over bedrock. Very deep soils are more than 60 inches deep over bedrock; deep soils, 40 to 60 inches; moderately deep, 20 to 40 inches; shallow, 10 to 20 inches; and very shallow, less than 10 inches.

**Depth to rock** (in tables). Bedrock is too near the surface for the specified use.

**Desert pavement.** On a desert surface, a layer of gravel or larger fragments that was emplaced by upward movement of the underlying sediments or that

remains after finer particles have been removed by running water or the wind.

**Dip slope.** A slope of the land surface, roughly determined by and approximately conforming to the dip of the underlying bedrock.

**Diversion (or diversion terrace).** A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

**Divided-slope farming.** A form of field stripcropping in which crops are grown in a systematic arrangement of two strips, or bands, across the slope to reduce the hazard of water erosion. One strip is in a close-growing crop that provides protection from erosion, and the other strip is in a crop that provides less protection from erosion. This practice is used where slopes are not long enough to permit a full stripcropping pattern to be used.

**Dominant trees.** Trees whose crowns form the general level of the forest canopy and that receive full light from above and from the sides.

**Drainage class (natural).** Refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are: recognized = excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained, and very poorly drained. These classes are defined in the "Soil Survey Manual."

**Drainage, surface.** Runoff, or surface flow of water, from an area.

**Drainageway.** An area of ground at a lower elevation than the surrounding ground and in which water collects and is drained to a closed depression or lake or to a drainageway at a lower elevation. A drainageway may or may not have distinctly incised channels at its upper reaches or throughout its course.

**Duff.** A generally firm organic layer on the surface of mineral soils. It consists of fallen plant material that is in the process of decomposition and includes everything from the litter on the surface to underlying pure humus.

**Dune.** A mound, ridge, or hill of loose, windblown granular material (generally sand), either bare or covered with vegetation.

**Ecological Site.** A distinctive kind of rangeland or grazed forestland that has a unique historic potential native plant community. Ecological sites are the products of all the environmental factors that affect their development. An ecological site is capable of supporting a native plant community that has a unique kind and/or proportion of species or total vegetative production. Ecological sites in grazed forestland include both overstory and understory vegetation.

**Effervescence.** The quality of a soil measured when drops of diluted (1:10) hydrochloric acid (HCl) are added to the soil. The ratings are as follows:

Very slightly effervescent ..... few bubbles  
Slightly effervescent.....bubbles readily  
Strongly effervescent ..... bubbles form low foam  
Violently effervescent.....bubbles form thick foam quickly

**Eluviation.** The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

**Endosaturation.** A type of saturation of the soil in which all horizons between the upper boundary of saturation and a depth of 2 meters are saturated.

**Eolian soil material.** Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

**Ephemeral stream.** A stream, or reach of a stream, that flows only in direct response to precipitation. It receives no long-continued supply from melting snow or other source, and its channel is above the water table at all times.

**Episaturation.** A type of saturation indicating a perched water table in a soil in which saturated layers are underlain by one or more unsaturated layers within 2 meters of the surface.

**Erosion.** The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.  
*Erosion* (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

*Erosion* (accelerated). Erosion that is much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

**Erosion pavement.** A layer of gravel or stones that remains on the surface after fine particles are removed by sheet or rill erosion.

**Escarpment.** A relatively continuous and steep slope or cliff breaking the general continuity of more gently sloping land surfaces and resulting from erosion or faulting. Synonym: scarp.

**Even aged.** Refers to a stand of trees in which only small differences in age occur between the individuals. A range of 20 years is allowed.

**Excess alkali** (in tables). Excess exchangeable sodium in the soil. The resulting poor physical properties restrict the growth of plants.

**Excess fines** (in tables). Excess silt and clay in the soil. The soil does not provide a source of gravel or sand for construction purposes.

**Excess lime** (in tables). Excess carbonates in the soil that restrict the growth of some plants.

**Excess salts** (in tables). Excess water-soluble salts in the soil that restrict the growth of most plants.

**Excess sodium** (in tables). Excess exchangeable sodium in the soil. The resulting poor physical properties restrict the growth of plants.

**Excess sulfur** (in tables). Excessive amount of sulfur in the soil. The sulfur causes extreme acidity if the soil is drained, and the growth of most plants is restricted.

**Extrusive rock.** Igneous rock derived from deep-seated molten matter (magma) emplaced on the earth's surface.

**Fallow.** Cropland left idle in order to restore productivity through accumulation of moisture. Summer fallow is common in regions of limited rainfall where cereal grain is grown. The soil is tilled for at least one growing season for weed control and decomposition of plant residue.

**Fan apron.** A sheet-like mantle of relatively young alluvium covering part of an older fan piedmont surface. It somewhere buries a soil that can be traced to the edge of the fan apron.

**Fan piedmont.** The most extensive landform on piedmont slopes, formed by the coalescence of alluvial fans or accretions of fan aprons into one generally smooth slope.

**Fan remnant.** A general term for landforms that are remaining parts of older fan-landforms, that either have been dissected or partially buried.

**Fan skirt.** The zone of smooth, laterally-coalescing, small alluvial fans that issue from gullies cut into the fan piedmont or that are the coalescing extensions of inset fans of the fan piedmont, and that merge with the basin floor.

**Fast intake** (in tables). The rapid movement of water into the soil.

**Fertility, soil.** The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

**Fibric soil material (peat).** The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.

**Field moisture capacity.** The moisture content of a soil, expressed as a percentage of the oven-dry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity*, *normal moisture capacity*, or *capillary capacity*.

**Fill slope.** A sloping surface consisting of excavated soil material from a road cut. It commonly is on the downhill side of the road.

**Fine textured soil.** Sandy clay, silty clay, or clay.

**Firebreak.** An area cleared of flammable material to stop or help control creeping or running fires. It also serves as a line from which to work and to facilitate the movement of fire fighters and



- equipment. Designated roads also serve as firebreaks.
- First bottom.** The normal flood plain of a stream, subject to frequent or occasional flooding.
- Flaggy soil material.** Material that is, by volume, 15 to 35 percent flagstones. Very flaggy soil material is 35 to 60 percent flagstones, and extremely flaggy soil material is more than 60 percent flagstones.
- Flagstone.** A thin fragment of sandstone, limestone, slate, shale, or (rarely) schist 6 to 15 inches (15 to 38 centimeters) long.
- Flood plain.** A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.
- Fluvial.** Of or pertaining to rivers; produced by river action, as a fluvial plain.
- Foothill.** A steeply sloping upland that has relief of as much as 1,000 feet (300 meters) and fringes a mountain range or high-plateau escarpment.
- Foot slope.** The inclined surface at the base of a hill.
- Forb.** Any herbaceous plant not a grass or a sedge.
- Forest cover.** All trees and other woody plants (underbrush) covering the ground in a forest.
- Fragile** (in tables). A soil that is easily damaged by use or disturbance.
- Frost action** (in tables). Freezing and thawing of soil moisture. Frost action can damage roads, buildings and other structures, and plant roots.
- Genesis, soil.** The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.
- Gilgai.** The microrelief of clayey soils that shrink and swell considerably with changes in moisture content. Usually manifested as a succession of microbasins and microknolls in nearly level areas or of microvalleys and microridges parallel with the slope.
- Gleyed soil.** Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors.
- Graded stripcropping.** Growing crops in strips that grade toward a protected waterway.
- Grassed waterway.** A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.
- Gravel.** Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.
- Gravelly soil material.** Material that is 15 to 50 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.
- Green manure crop** (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.
- Ground water.** Water filling all the unblocked pores of underlying material below the water table.
- Gully.** A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.
- Gypsum.** A mineral consisting of hydrous calcium sulfate.
- Hard bedrock.** Bedrock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.
- Hardpan.** A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.
- Heavy metal.** Inorganic substances that are solid at ordinary temperatures and are not soluble in water. They form oxides and hydroxides that are basic. Examples are copper, iron, cadmium, zinc, manganese, lead, and arsenic.
- Hemic soil material (mucky peat).** Organic soil material intermediate in degree of decomposition between the less decomposed fibric material and the more decomposed sapric material.
- High-residue crops.** Such crops as small grain and corn used for grain. If properly managed, residue from these crops can be used to control erosion until the next crop in the rotation is established. These crops return large amounts of organic matter to the soil.
- Hill.** A natural elevation of the land surface, rising as much as 1,000 feet above surrounding lowlands, commonly of limited summit area and having a well defined outline; hillsides generally have slopes of more than 15 percent. The distinction between a hill and a mountain is arbitrary and is dependent on local usage.
- Holocene.** The epoch of the Quaternary Period of geologic time, extending from the end of the Pleistocene Epoch (about 10 to 12 thousand years ago) to the present.
- Horizon, soil.** A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. The major horizons of mineral soil are as follows:
- O horizon.*--An organic layer of fresh and decaying plant residue.
- A horizon.*--The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.
- E horizon.*--The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

**B horizon.**--The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

**C horizon.**--The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

**Cr horizon.**--Soft, consolidated bedrock beneath the soil.

**R layer.**--Consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

**Humus.** The well decomposed, more or less stable part of the organic matter in mineral soils.

**Hydrologic soil groups.** Refers to soils grouped according to their runoff potential. The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties are depth to a seasonal high water table, the infiltration rate and permeability after prolonged wetting, and depth to a very slowly permeable layer. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

**Igneous rock.** Rock formed by solidification from a molten or partially molten state. Major varieties include plutonic and volcanic rock. Examples are andesite, basalt, and granite.

**Illuviation.** The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

**Impervious soil.** A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

**Increasers.** Species in the climax vegetation that increase in amount as the more desirable plants are reduced by close grazing. Increasers commonly are the shorter plants and the less palatable to livestock.

**Infiltration.** The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

**Infiltration capacity.** The maximum rate at which water can infiltrate into a soil under a given set of conditions.

**Infiltration rate.** The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

**Inset fan.** A special case of the flood plain of an ephemeral stream that is confined between fan remnants, basin-floor remnants, ballenas, or closely opposed fan toeslopes.

**Intake rate.** The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Less than 0.2.....	very low
0.2 to 0.4.....	low
0.4 to 0.75.....	moderately low
0.75 to 1.25.....	moderate
1.25 to 1.75.....	moderately high
1.75 to 2.5.....	high
More than 2.5.....	very high

**Intermittent stream.** A stream, or reach of a stream, that flows for prolonged periods only when it receives groundwater discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

**Intermontane basin.** A generic term for wide structural depressions between mountain ranges that are partly filled with alluvium. They may be drained internally (bolsons) or externally (semi-bolsons).

**Invaders.** On range, plants that encroach into an area and grow after the climax vegetation has been reduced by grazing. Generally, plants invade following disturbance of the surface.

**Iron depletions.** Low-chroma zones having a low content of iron and manganese oxide because of chemical reduction and removal, but having a clay content similar to that of the adjacent matrix. A type of redoximorphic depletion.

**Irrigation.** Application of water to soils to assist in production of crops. Methods of irrigation are:

**Basin.**--Water is applied rapidly to nearly level plains surrounded by levees or dikes.

**Border.**--Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

**Controlled flooding.**--Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

**Corrugation.**--Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

**Drip (or trickle).**--Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.



**Furrow.**--Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

**Sprinkler.**--Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

**Subirrigation.**--Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

**Wild flooding.**--Water, released at high points, is allowed to flow onto an area without controlled distribution.

**Lacustrine deposit.** Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

**Lagoon.** The nearly level, filled depression behind the longshore bar on a barrier beach.

**Lake plain.** A surface marking the floor of an extinct lake, filled in by well sorted, stratified sediments.

**Lake terrace.** The narrow shelf produced along a lake shore and later exposed when the water recedes.

**Lamella.** A thin, generally horizontal layer of fine material illuviated within a very much thicker, coarser, eluviated layer.

**Landform.** Any recognizable form or feature on the earth's surface, having a characteristic shape, and produced by natural causes that provide an empirical description of similar portions of the earth's surface.

**Landscape.** A collection of related, natural landforms.

**Landslide.** The rapid downhill movement of a mass of soil and loose rock, generally when wet or saturated. The speed and distance of movement, as well as the amount of soil and rock material, vary greatly.

**Large stones** (in tables). Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

**Leaching.** The removal of soluble material from soil or other material by percolating water.

**Liquid limit.** The moisture content at which the soil passes from a plastic to a liquid state.

**Loam.** Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

**Loamy soil.** Coarse sandy loam, sandy loam, fine sandy loam, very fine sandy loam, loam, silt loam, silt, clay loam, sandy clay loam, or silty clay loam.

**Loess.** Fine grained material, dominantly of silt-sized particles, deposited by wind.

**Longshore bar.** A narrow, elongate, coarse-textured ridge, built by the wave action of a pluvial lake, that extends parallel to the shore and separated it from a lagoon; both the bar and lagoon are now relict features.

**Low-residue crops.** Such crops as corn used for silage, peas, beans, and potatoes. Residue from these crops is not adequate to control erosion until the next crop in the rotation is established. These crops return little organic matter to the soil.

**Low strength.** The soil is not strong enough to support loads.

**Marl.** An earthy, unconsolidated deposit consisting chiefly of calcium carbonate mixed with clay in approximately equal amounts.

**Masses.** Concentrations of substances in the soil matrix that do not have a clearly defined boundary with the surrounding soil material and cannot be removed as a discrete unit. Common compounds making up masses are calcium carbonate, gypsum or other soluble salts, iron oxide, and manganese oxide. Masses consisting of iron oxide or manganese oxide generally are considered a type of redoximorphic concentration.

**Mean annual increment (MAI).** The average annual increase in volume of a tree during the entire life of the tree.

**Mechanical treatment.** Use of mechanical equipment for seeding, brush management, and other management practices.

**Medium textured soil.** Very fine sandy loam, loam, silt loam, or silt.

**Merchantable trees.** Trees that are of sufficient size to be economically processed into wood products.

**Metamorphic rock.** Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement. Nearly all such rocks are crystalline.

**Mineral soil.** Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

**Minimum tillage.** Only the tillage essential to crop production and prevention of soil damage.

**Miscellaneous area.** An area that has little or no natural soil and supports little or no vegetation.

**Moderately coarse textured soil.** Coarse sandy loam, sandy loam, or fine sandy loam.

**Moderately deep soil.** A soil that is 20 to 40 inches deep over bedrock or to other material that restricts the penetration of plant roots.

**Moderately fine textured soil.** Clay loam, sandy clay loam, or silty clay loam.

**Mollic epipedon.** A thick, dark, humus-rich surface horizon (or horizons) that has high base saturation and pedogenic soil structure. It may include the upper part of the subsoil.

**Morphology, soil.** The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

**Mottling, soil.** Irregular spots of different colors that vary in number and size. Descriptive terms are as follows: abundance--*few*, *common*, and *many*; size--*fine*, *medium*, and *coarse*; and contrast--*faint*, *distinct*, and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

**Mountain.** A natural elevation of the land surface, rising more than 1,000 feet above surrounding lowlands, commonly of restricted summit area (relative to a plateau) and generally having steep sides. A mountain can occur as a single, isolated mass or in a group forming a chain or range.

**Muck.** Dark, finely divided, well decomposed organic soil material. (See Sapric soil material.)

**Mudstone.** Sedimentary rock formed by induration of silt and clay in approximately equal amounts.

**Munsell notation.** A designation of color by degrees of three simple variables--hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

**Natric horizon.** A special kind of argillic horizon that contains enough exchangeable sodium to have an adverse effect on the physical condition of the subsoil.

**Neutral soil.** A soil having a pH value between 6.6 and 7.3. (See Reaction, soil.)

**Nodules.** Cemented bodies lacking visible internal structure. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up nodules. If formed in place, nodules of iron oxide or manganese oxide are considered types of redoximorphic concentrations.

**Nutrient, plant.** Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

**Observed rooting depth.** Depth to which roots have been observed to penetrate.

**Organic matter.** Plant and animal residue in the soil in various stages of decomposition.

**Overstory.** The trees in a forest that form the upper crown cover.

**Oxbow.** The horseshoe-shaped channel of a former meander, remaining after the stream formed a cutoff across a narrow meander neck.

**Pan.** A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan*, *fragipan*, *claypan*, *plowpan*, and *traffic pan*.

**Parent material.** The unconsolidated organic and mineral material in which soil forms.

**Parna dune.** An eolian dune built of sand size aggregates of clayey material that commonly occurs leeward of a playa.

**Peat.** Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture. (See Fibric soil material.)

**Ped.** An individual natural soil aggregate, such as a granule, a prism, or a block.

**Pediment.** A gently sloping erosional surface developed at the foot of a receding hill or mountain slope.

**Pedisediment.** A thin layer of alluvial material that mantles an erosion surface and has been

transported to its present position from higher lying areas of the erosion surface.

**Pedon.** The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

**Percolation.** The downward movement of water through the soil.

**Percs slowly** (in tables). The slow movement of water through the soil adversely affects the specified use.

**Permeability.** The quality of the soil that enables water or air to move downward through the profile. The rate at which a saturated soil transmits water is accepted as a measure of this quality. In soil physics, the rate is referred to as "saturated hydraulic conductivity," which is defined in the "Soil Survey Manual." In line with conventional usage in the engineering profession and with traditional usage in published soil surveys, this rate of flow continues to be expressed as "permeability." Terms describing permeability, measured in inches per hour, are as follows:

Extremely slow.....	0.00 to 0.01 inch
Very slow.....	0.01 to 0.06 inch
Slow.....	0.06 to 0.2 inch
Moderately slow.....	0.2 to 0.6 inch
Moderate.....	0.6 inch to 2.0 inches
Moderately rapid.....	2.0 to 6.0 inches
Rapid.....	6.0 to 20 inches
Very rapid.....	more than 20 inches

**Phase, soil.** A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

**pH value.** A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

**Piedmont slope.** The dominant slope at the foot of a mountain. Main components of the piedmont slope include pediments, alluvial fans, fan piedmonts, fan skirts and inset fans.

**Piping** (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

**Pitting** (in tables). Pits caused by melting around ice. They form on the soil after plant cover is removed.

**Plasticity index.** The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

**Plastic limit.** The moisture content at which a soil changes from semisolid to plastic.

**Plateau.** An extensive upland mass with relatively flat summit area that is considerably elevated (more than 100 meters) above adjacent lowlands and separated from them on one or more sides by escarpments.

**Playa.** The generally dry and nearly level lake plain that occupies the lowest parts of closed depressional areas, such as those on intermontane basin floors. Temporary flooding occurs primarily in response to precipitation and runoff.



**Pleistocene.** The epoch of the Quaternary Period of geologic time preceding the Holocene (from approximately 2 million to 10 thousand years ago).

**Plowpan.** A compacted layer formed in the soil directly below the plowed layer.

**Pluvial.** Relating to former periods of abundant rains.

**Ponding.** Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

**Poor filter** (in tables). Because of rapid or very rapid permeability, the soil may not adequately filter effluent from a waste disposal system.

**Poorly graded.** Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

**Poor outlets** (in tables). Refers to areas where surface or subsurface drainage outlets are difficult or expensive to install.

**Potential native plant community.** See Climax plant community.

**Potential rooting depth (effective rooting depth).** Depth to which roots could penetrate if the content of moisture in the soil were adequate. The soil has no properties restricting the penetration of roots to this depth.

**Prescribed burning.** Deliberately burning an area for specific management purposes, under the appropriate conditions of weather and soil moisture and at the proper time of day.

**Productivity, soil.** The capability of a soil for producing a specified plant or sequence of plants under specific management.

**Profile, soil.** A vertical section of the soil extending through all its horizons and into the parent material.

**Proper grazing use.** Grazing at an intensity that maintains enough cover to protect the soil and maintain or improve the quantity and quality of the desirable vegetation. This practice increases the vigor and reproduction capacity of the key plants and promotes the accumulation of litter and mulch necessary to conserve soil and water.

**Quartzite, metamorphic.** Rock consisting mainly of quartz that formed through recrystallization of quartz-rich sandstone or chert.

**Quaternary.** The period of geologic time extending from about 2 million years ago to the present and comprising two epochs, the Pleistocene (Ice Age) and Holocene (Recent).

**Quartzite, sedimentary.** Very hard but unmetamorphosed sandstone consisting chiefly of quartz grains.

**Range condition.** The present composition of the plant community on a range site in relation to the potential natural plant community for that site. Range condition is expressed as excellent, good, fair, or poor on the basis of how much the present plant community has departed from the potential.

**Rangeland.** Land on which the potential natural vegetation is predominantly grasses, grasslike plants, forbs, or shrubs suitable for grazing or browsing. It includes natural grasslands, savannas, many wetlands, some deserts, tundras, and areas that support certain forb and shrub communities.

**Range site.** An area of rangeland where climate, soil, and relief are sufficiently uniform to produce a distinct natural plant community. A range site is the product of all the environmental factors responsible for its development. It is typified by an association of species that differ from those on other range sites in kind or proportion of species or total production.

**Reaction, soil.** A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Ultra acid.....	less than 3.5
Extremely acid.....	3.5 to 4.4
Very strongly acid.....	4.5 to 5.0
Strongly acid.....	5.1 to 5.5
Moderately acid.....	5.6 to 6.0
Slightly acid.....	6.1 to 6.5
Neutral.....	6.6 to 7.3
Slightly alkaline . (mildly alkaline).....	7.4 to 7.8
Moderately alkaline.....	7.9 to 8.4
Strongly alkaline.....	8.5 to 9.0
Very strongly alkaline.....	9.1 and higher

**Redoximorphic concentrations.** Nodules, concretions, soft masses, pore linings, and other features resulting from the accumulation of iron or manganese oxide. An indication of chemical reduction and oxidation resulting from saturation.

**Redoximorphic depletions.** Low-chroma zones from which iron and manganese oxide or a combination of iron and manganese oxide and clay has been removed. These zones are indications of the chemical reduction of iron resulting from saturation.

**Redoximorphic features.** Redoximorphic concentrations, redoximorphic depletions, reduced matrices, a positive reaction to alpha,alpha-dipyridyl, and other features indicating the chemical reduction and oxidation of iron and manganese compounds resulting from saturation.

**Reduced matrix.** A soil matrix that has low chroma in situ because of chemically reduced iron (Fe II). The chemical reduction results from nearly continuous wetness. The matrix undergoes a change in hue or chroma within 30 minutes after exposure to air as the iron is oxidized (Fe III). A type of redoximorphic feature.

**Regeneration.** The new growth of a natural plant community, developing from seed.

**Regolith.** The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock.

**Relict stream terrace.** One of a series of platforms in or adjacent to a stream valley that formed prior to the current stream system.

**Relief.** The elevations or inequalities of a land surface, considered collectively.

**Residuum (residual soil material).** Unconsolidated, weathered or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

**Rill.** A steep-sided channel resulting from accelerated erosion. A rill is generally a few inches deep and not wide enough to be an obstacle to farm machinery.

**Riverwash.** Unstable areas of sandy, silty, clayey, or gravelly sediments. These areas are flooded, washed, and reworked by rivers so frequently that they support little or no vegetation.

**Road cut.** A sloping surface produced by mechanical means during road construction. It is commonly on the uphill side of the road.

**Rock fragments.** Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

**Rock outcrop.** Exposures of bare bedrock other than lava flows and rock-lined pits.

**Rooting depth** (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

**Root zone.** The part of the soil that can be penetrated by plant roots.

**Rubble land.** Areas that have more than 90 percent of the surface covered by stones or boulders. Voids contain no soil material and virtually no vegetation other than lichens. The areas commonly are at the base of mountain slopes, but some are on mountain slopes as deposits of cobbles, stones, and boulders left by Pleistocene glaciation or by periglacial phenomena.

**Runoff.** The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called groundwater runoff or seepage flow from ground water.

**Saline soil.** A soil containing soluble salts in an amount that impairs the growth of plants. A saline soil does not contain excess exchangeable sodium.

**Salinity.** The electrical conductivity of a saline soil. It is expressed, in millimhos per centimeter, as follows:

Nonsaline .....	0 to 2
Very slightly saline .....	2 to 4
Slightly saline .....	4 to 8
Moderately saline .....	8 to 16
Strongly saline .....	More than 16

**Salty water** (in tables). Water that is too salty for consumption by livestock.

**Sand.** As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

**Sand sheet.** A large, irregularly shaped, surficial mantle of eolian sand.

**Sandstone.** Sedimentary rock containing dominantly sand-sized particles.

**Sandy soil.** Sand or loamy sand.

**Sapric soil material (muck).** The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

**Saprolite.** Unconsolidated residual material underlying the soil and grading to hard bedrock below.

**Saturation.** Wetness characterized by zero or positive pressure of the soil water. Under conditions of saturation, the water will flow from the soil matrix into an unlined auger hole.

**Sawlogs.** Logs of suitable size and quality for the production of lumber.

**Scarification.** The act of abrading, scratching, loosening, crushing, or modifying the surface to increase water absorption or to provide a more tillable soil.

**Scribner's log rule.** A method of estimating the number of board feet that can be cut from a log of a given diameter and length.

**Second bottom.** The first terrace above the normal flood plain (or first bottom) of a river.

**Sedimentary rock.** Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

**Seepage** (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

**Semi-bolson.** An intermontane basin that is drained externally by an intermittent stream.

**Sequum.** A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

**Series, soil.** A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

**Shale.** Sedimentary rock formed by the hardening of a clay deposit.

**Shallow soil.** A soil that is 10 to 20 inches deep over bedrock or to other material that restricts the penetration of plant roots.

**Sheet erosion.** The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

**Shelterwood system.** A forest management system requiring the removal of a stand in a series of cuts so that regeneration occurs under a partial canopy. After regeneration, a final cut removes the shelterwood and allows the stand to develop in the open as an even-aged stand. The system is



- well suited to sites where shelter is needed for regeneration, and it can aid regeneration of the more intolerant tree species in a stand.
- Shoulder slope.** The uppermost inclined surface at the top of a hillside. It is the transition zone from the back slope to the summit of a hill or mountain. The surface is dominantly convex in profile and erosional in origin.
- Shrink-swell** (in tables). The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.
- Shrub-coppice dune.** A small dune that forms around shrubs or small trees.
- Silica.** A combination of silicon and oxygen. The mineral form is called quartz.
- Silt.** As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.
- Siltstone.** Sedimentary rock made up of dominantly silt-sized particles.
- Similar soils.** Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.
- Sinkhole.** A depression in the landscape where limestone has been dissolved.
- Site class.** A grouping of site indexes into five to seven production capability levels. Each level can be represented by a site curve.
- Site curve (50-year).** A set of related curves on a graph that shows the average height of dominant or dominant and codominant trees for the range of ages on soils that differ in productivity. Each level is represented by a curve. The basis of the curves is the height of dominant or dominant and codominant trees that are 50 years old or are 50 years old at breast height.
- Site curve (100-year).** A set of related curves on a graph that shows the average height of dominant or dominant and codominant trees for a range of ages on soils that differ in productivity. Each level is represented by a curve. The basis of the curves is the height of dominant or dominant and codominant trees that are 100 years old or are 100 years old at breast height.
- Site index.** A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75.
- Skid trails.** Pathways along which logs are dragged to a common site for loading onto a logging truck.

- Slash.** The branches, bark, treetops, reject logs, and broken or uprooted trees left on the ground after logging.
- Slickens.** Accumulations of fine-textured material, such as material separated in placer mine and ore mill operations. Slickens from ore mills commonly consist of freshly ground rock that has undergone chemical treatment during the milling process.
- Slickensides.** Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms, and columns; and in swelling clayey soils, where there is marked change in moisture content.
- Slick spot.** A small area of soil having a puddled, crusted, or smooth surface and an excess of exchangeable sodium. The soil generally is silty or clayey, is slippery when wet, and is low in productivity.
- Slippage** (in tables). Soil mass susceptible to movement downslope when loaded, excavated, or wet.
- Slope.** The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance. In this survey the following slope classes are recognized:

Nearly level.....	0 to 2 percent
Gently sloping .....	2 to 4 percent
Moderately sloping.....	4 to 8 percent
Strongly sloping.....	8 to 15 percent
Moderately steep.....	15 to 30 percent
Steep .....	30 to 50 percent
Very steep.....	50 to 75 percent
Extremely steep.....	75 percent and higher

- Slope** (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.
- Slow intake** (in tables). The slow movement of water into the soil.
- Slow refill** (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.
- Small stones** (in tables). Rock fragments less than 3 inches (7.6 centimeters) in diameter. Small stones adversely affect the specified use of the soil.
- Sodic (alkali) soil.** A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.
- Sodicity.** The degree to which a soil is affected by exchangeable sodium. Sodicity is expressed as a sodium adsorption ratio (SAR) of a saturation extract, or the ratio of  $\text{Na}^+$  to  $\text{Ca}^{++} + \text{Mg}^{++}$ . The degrees of sodicity and their respective ratios are:

Very slight .....	5-12:1
Slight .....	13-30:1
Moderate .....	31-45:1
Strong.....	46-90:1
Very strong.....	more than 90:1

**Soft bedrock.** Bedrock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

**Soil.** A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

**Soil separates.** Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand .....	2.0 to 1.0
Coarse sand .....	1.0 to 0.5
Medium sand .....	0.5 to 0.25
Fine sand .....	0.25 to 0.10
Very fine sand .....	0.10 to 0.05
Silt .....	0.05 to 0.002
Clay .....	less than 0.002

**Solum.** The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the material below the solum. The living roots and plant and animal activities are largely confined to the solum.

**Species.** A single, distinct kind of plant or animal having certain distinguishing characteristics.

**Stone line.** A concentration of coarse fragments in a soil. Generally, it is indicative of an old weathered surface. In a cross section, the line may be one fragment or more thick. It generally overlies material that weathered in place and is overlain by recent sediment of variable thickness.

**Stones.** Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

**Stony.** Refers to a soil containing stones in numbers that interfere with or prevent tillage.

**Strath terrace.** A surface cut formed by the erosion of hard or semiconsolidated bedrock and thinly mantled with stream deposits.

**Stream channel.** The hollow bed where a natural stream of surface water flows or may flow; the deepest or central part of the bed, formed by the main current and covered more or less continuously by water.

**Stream terrace.** One of a series of platforms in a stream valley, flanking and more or less parallel to the stream channel. It originally formed near the level of the stream and is the dissected remnants of an abandoned flood plain, streambed, or valley floor that were produced during a former stage of erosion or deposition.

**Stripcropping.** Growing crops in a systematic arrangement of strips or bands that provide

vegetative barriers to soil blowing and water erosion.

**Structure, soil.** The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are: *platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grain* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

**Stubble mulch.** Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

**Subsoil.** Technically, the B horizon; roughly, the part of the solum below plow depth.

**Subsoiling.** Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.

**Substratum.** The part of the soil below the solum.

**Subsurface layer.** Technically, the E horizon. Generally refers to a leached horizon lighter in color and lower in content of organic matter than the overlying surface layer.

**Subsurface layer.** Any surface soil horizon (A, E, AB, or EB) below the surface layer.

**Summer fallow.** The tillage of uncropped land during the summer to control weeds and allow storage of moisture in the soil for the growth of a later crop. A practice common in semiarid regions, where annual precipitation is not enough to produce a crop every year. Summer fallow is frequently practiced before planting winter grain.

**Summit.** A general term for the top, or highest level, of an upland feature, such as a hill or mountain. It commonly refers to a higher area that has a gentle slope and is flanked by steeper slopes.

**Surface layer.** The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

**Surface soil.** The A, E, AB, and EB horizons, considered collectively. It includes all subdivisions of these horizons.

**Tailwater.** The water directly downstream of a structure.

**Talus.** Fragments of rock and other soil material accumulated by gravity at the foot of cliffs or steep slopes.

**Taxadjuncts.** Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior. Soils are recognized as taxadjuncts only when one or more of their characteristics are slightly outside



the range defined for the family of the series for which the soils are named.

**Terrace.** An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field is generally built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

**Terrace (geologic).** A step-like surface, ordinarily flat or undulating, bordering a river, a lake, or the sea representing a former flood plain.

**Texture, soil.** The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand*, *loamy sand*, *sandy loam*, *loam*, *silt loam*, *silt*, *sandy clay loam*, *clay loam*, *silty clay loam*, *sandy clay*, *silty clay*, and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

**Thin layer (in tables).** Otherwise suitable soil material too thin for the specified use.

**Till plain.** An extensive area of nearly level to undulating soils underlain by glacial till.

**Tilth, soil.** The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

**Toe slope.** The outermost inclined surface at the base of a hill; part of a foot slope.

**Too arid (in tables).** The soil is dry most of the time, and vegetation is difficult to establish.

**Topsoil.** The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

**Toxicity (in tables).** Excessive amount of toxic substances, such as sodium or sulfur, that severely hinder establishment of vegetation or severely restrict plant growth.

**Trace elements.** Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, in soils in extremely small amounts. They are essential to plant growth.

**Trafficability.** The degree to which a soil is capable of supporting vehicular traffic across a wide range in soil moisture conditions.

**Tread.** The relatively flat terrace surface that was cut or built by stream or wave action.

**Tuff.** A compacted deposit that is 50 percent or more volcanic ash and dust.

**Understory.** Any plants in a forest community that

grow to a height of less than 5 feet.

**Unstable fill (in tables).** Risk of caving or sloughing on banks of fill material.

**Upland (geology).** Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

**Valley.** An elongated depressional area primarily developed by stream action.

**Valley fill.** In glaciated regions, material deposited in stream valleys by glacial meltwater. In nonglaciated regions, alluvium deposited by heavily loaded streams.

**Variegation.** Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

**Very deep soil.** A soil that is more than 60 inches deep over bedrock or to other material that restricts the penetration of plant roots.

**Very shallow soil.** A soil that is less than 10 inches deep over bedrock or to other material that restricts the penetration of plant roots.

**Water bars.** Smooth, shallow ditches or depressional areas that are excavated at an angle across a sloping road. They are used to reduce the downward velocity of water and divert it off and away from the road surface. Water bars can easily be driven over if constructed properly.

**Waterspreading.** Diverting runoff from natural channels by means of a system of dams, dikes, or ditches and spreading it over relatively flat surfaces.

**Water supplying capacity.** The total amount of water available in the soil for plant growth in a normal year from precipitation and from runoff from higher areas. Runoff and water lost to deep percolation are not included.

**Weathering.** All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

**Well graded.** Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

**Wilting point (or permanent wilting point).** The moisture content of soil, on an oven-dry basis, at which a plant (specifically, a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

**Windthrow.** The uprooting and tipping over of trees by the wind.





